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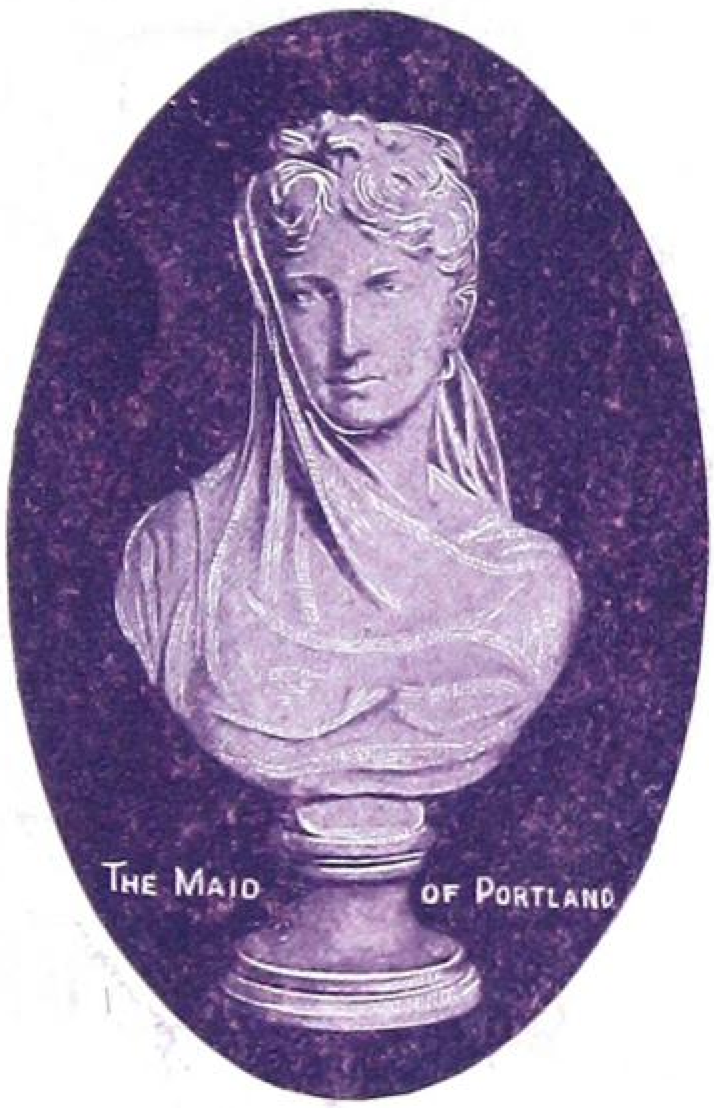
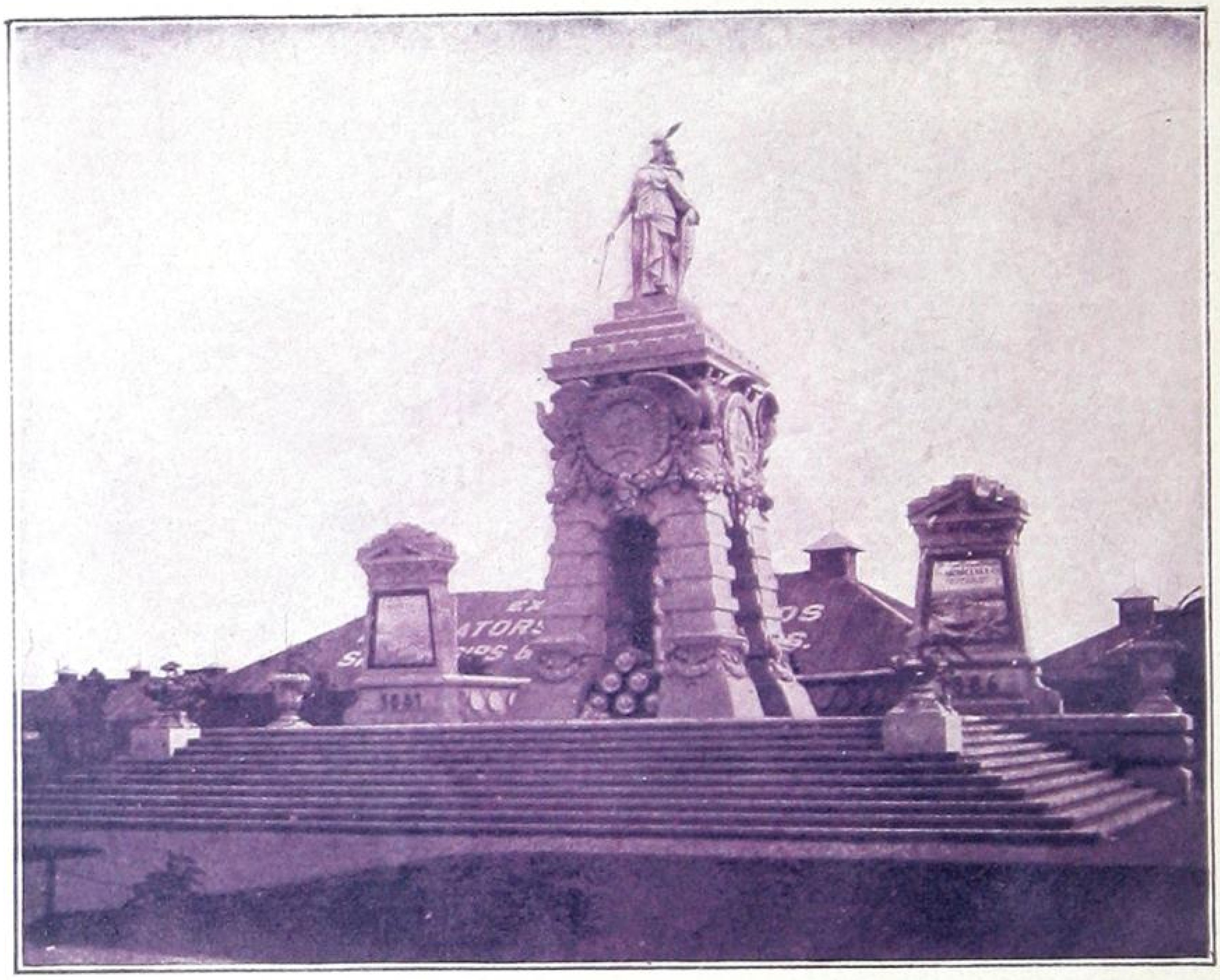
PROSPECTUS
The NATIONAL PORTLAND CEMENT CO. Limited



MODELLED IN PORTLAND CEMENT.

Entered according to Act of the Parliament of Canada, in the year 1901, by THE NATIONAL PORTLAND CEMENT Co., LIMITED, at the Department of Agriculture.



GERMANIA.

ENTIRE CONSTRUCTION OF PORTLAND CEMENT.

This statue with its impressive surroundings was erected at the World's Fair, Chicago, to show the possibilities of Portland Cement in art. Steps, floors, urns, tablets, pavilion and statue were all cast solid in Portland Cement. To builders, road-makers, pavement-layers, students in cement, and even sculptors, this majestic out-door German exhibit offered lessons both in art and experience for which the world owes to-day its gratitude.

LIBRARY of
THE
FRANKLIN
INSTITUTE

THE NATIONAL
PORTLAND CEMENT CO.

LIMITED.

Incorporated by Letters Patent under the Great Seal
of the Province of Ontario

General Offices: TORONTO, ONT.
Works: DURHAM, ONT.

CAPITAL STOCK - - - - $1,000,000
In 10,000 Shares of $100.00 each

DIRECTORS:

W. F. COWHAM,
Managing Director Peninsular Portland Cement Co., Jackson, Mich.

GILBERT MCKECHNIE, Ex-M.P.P.,
Merchant, Durham, Ont.

P. W. STANHOPE,
Ontario Manager McCormick Harvesting
Machine Co., Toronto, Ont.

A. F. MACLAREN, M.P., Stratford, Ont.
President A. F. MacLaren Imperial Cheese Co., Limited,
Toronto, Ont.

BARLOW CUMBERLAND,
Vice-President Niagara Navigation Co.,
Toronto, Ont.

BANKERS:
The Standard Bank of Canada, Toronto.

AUDITOR:
Jas. P. Langley, Chartered Accountant, Toronto.

SOLICITORS:
Blake, Lash & Cassels. Pinkerton & Cooke.

Address all communications to
THE NATIONAL PORTLAND CEMENT CO., Limited,
Rooms 4 and 5 Janes Building,
Cor. King and Yonge Streets, TORONTO, ONT.

Telephone—Main 3080.

Entered according to Act of the Parliament of Canada, in the year 1901, by THE NATIONAL PORTLAND CEMENT CO., LIMITED, at the Department of Agriculture.

THE objects of **The National Portland Cement Co., Limited,** as expressed by the Letters Patent, are to manufacture, buy, sell and otherwise deal in Portland Cement, to own, purchase, or lease marl or cement and clay land, developing and dealing in cement properties, with their products, and such other things as may be necessary or convenient to its business.

This book is published for the purpose of bringing The National Portland Cement Co. before the people and interesting them in this enterprise. It will treat briefly the subject of Portland Cement, the quality and quantity of raw materials, and the factory to be constructed. It will also touch on modern adaptations in the use of cement, illustrating late developments, and suggesting in a plain, honest and sensible manner the future possibilities for the cement business. This Company offers a wonderful opportunity for investment, one that will equal or surpass in earning powers the great industries of the world, and one that will be safe, sure and permanent. A careful study of the whole question cannot result in anything but favorable and important deductions, and a conclusion that the greatest possible benefit will be obtained by investors in this enterprise.

The properties intended to be utilized by The National Portland Cement Co. consist of about eight hundred acres of marl and clay lands in the vicinity of Durham, Ont., a great deal of which is advantageously located about two hundred feet above the level of the factory site, which renders it practicable to transport the material by means of the compressed air system, or otherwise, to the factory cheaply and conveniently, and numerous analyses show the deposit to be of exceptional value and purity of quality, and fully equal if not superior, to any known property in the world.

The mill site at Durham has a central location as regards the largest markets, has first-class shipping facilities, and special advantages for transportation of the product to all parts of the country have already been secured from the transportation companies.

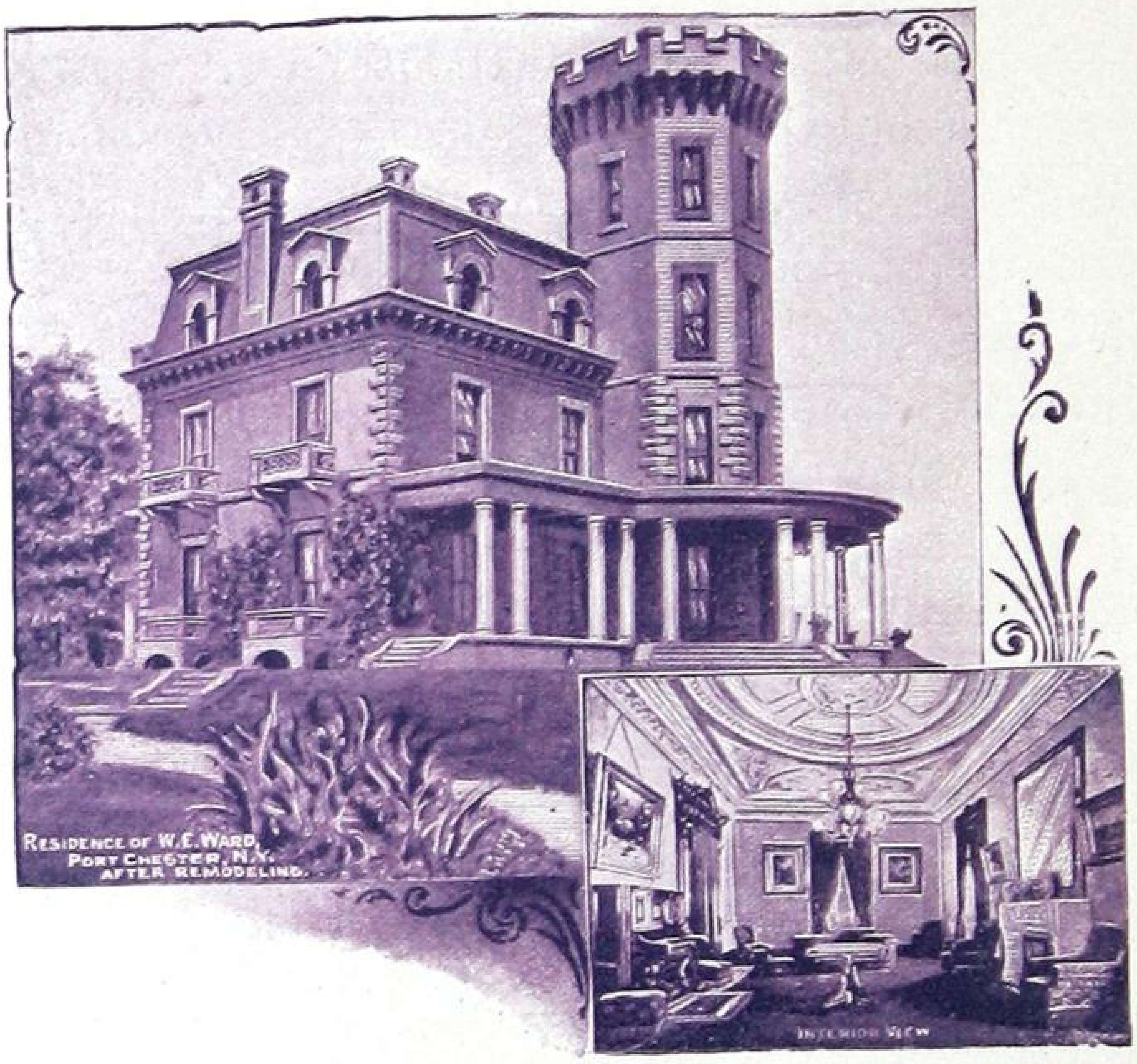
Portland Cement

THE history of natural or rock cement (the product of an impure limestone, composed of lime, magnesia and clay in more or less definite proportions, found in the native state) extends back nearly four thousand years to the time of the Egyptians, and through the succeeding ages many substantial structures were erected therefrom, but it was not until 1824 that a man named Apsdin, of Leeds, Yorkshire, England, manufactured by mixing and treating marl and clay in certain **definite** proportions a **much superior quality** of cement strongly resembling a stone much used at that time in building, which was quarried at Portland Bill, on the Cornish Coast. This he called **Portland Cement** and was the **origin of the name,** which has now become inseparable from energetic artificial hydraulic cements. The quality of the cement depends greatly on the thorough admixture of the two materials. The **Portland Cement manufacturer** has it in his power to control the

The Pantheon at Rome is the most perfect existing classical building in that famous old city.

It was built by Agrippa, 27 B.C., nearly 2000 years ago. The circular walls are about 20 feet in thickness, and the roof is a hemispherical cement concrete dome with a thirty-foot opening in the top and spanning in the clear 142 feet 6 inches. This is the most remarkable instance in the world's history showing the great strength, durability, and permanence in cement concrete constructions. It has baffled the destructive elements of time for nineteen centuries and shows not a single crack to-day.

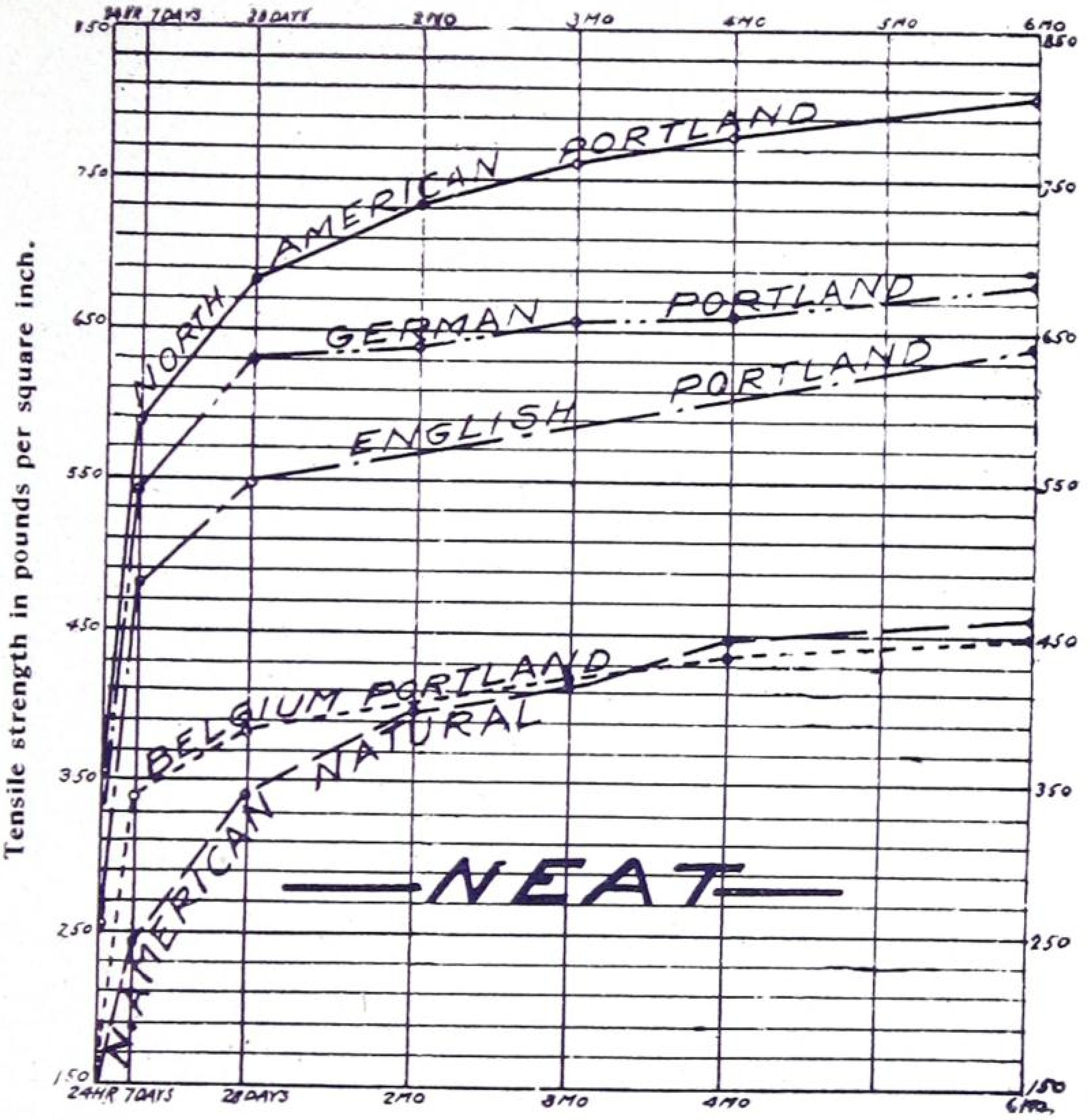
proportions of the materials which he uses and renders it possible for him to make his products uniform. Careful attention to proportions and mixing and care in the matter of calcination will produce a cement that seemingly leaves little to be desired. The chemical combination and method of manufacture have been continually perfected, until to-day **Portland Cement** is regarded throughout the world as the best known building material, and one of the necessities in all modern construction.


Residence of W. E. Ward, Port Chester, N.Y. After Remodeling.
Interior View

W. E. Ward's house, Port Chester, N.Y., the first American house monolythic in construction, built entirely of PORTLAND CEMENT CONCRETE 24 years ago, external and internal walls, towers, cornices, roofs, floors, beams, closets, stairs, balconies porticos and supporting columns, all moulded out of PORTLAND CEMENT. All of the external and many of the internal walls are made hollow, thereby furnishing a dead air chamber throughout the building. Everything of a combustible nature is excluded from the main construction. This building is in perfect condition to-day.

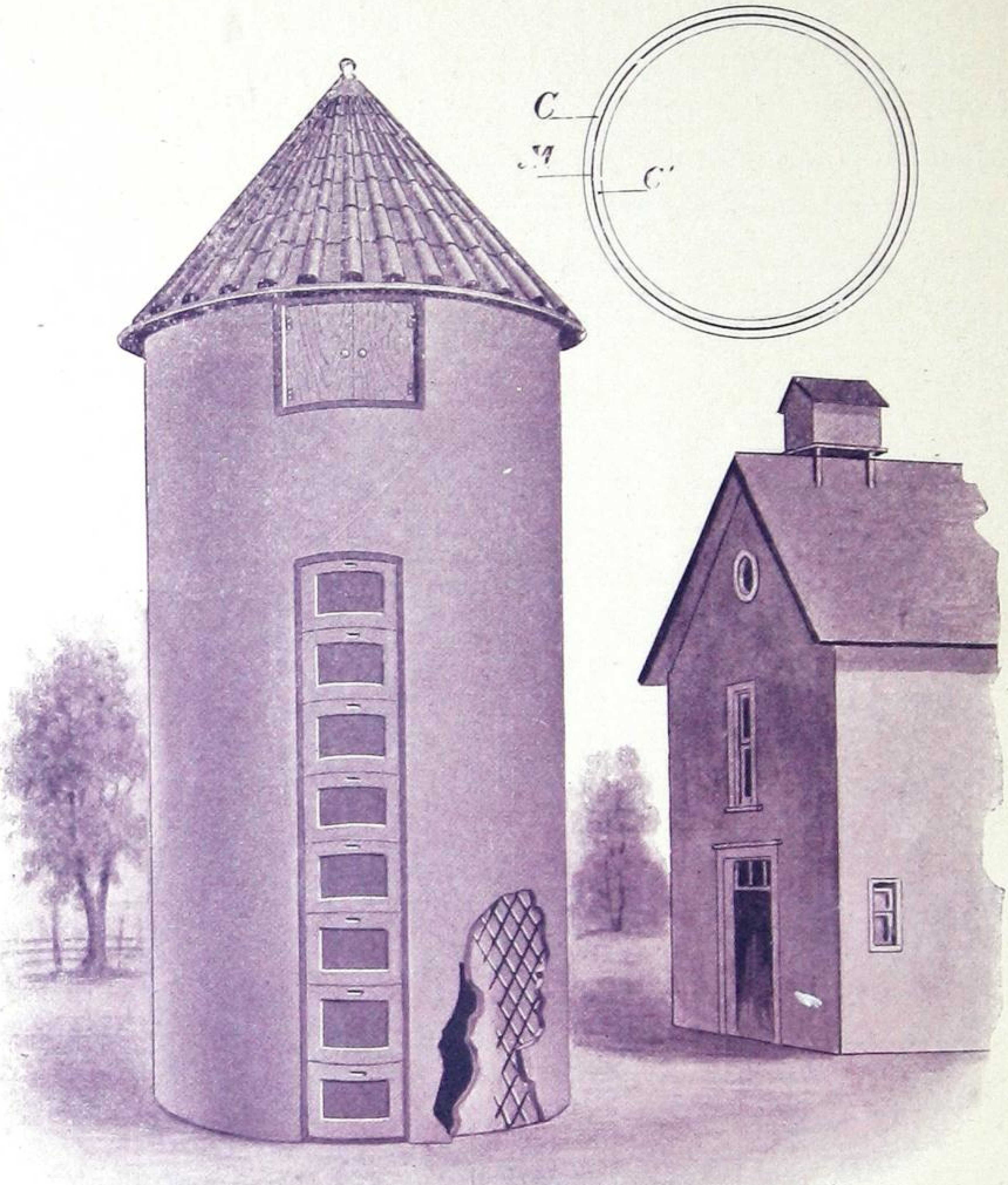
North American Superior Product

THE industry in North America is practically new. Only a few years ago all cement of this nature was imported from England and Germany. Gradually English makers lost control and the German product became the standard, but to-day the **Portland Cement** manufactured in America outclasses the foreign product by fully 20 per cent. This is extremely gratifying to know, when the amount of technical skill required in making a high grade article is taken into consideration.



Official diagram from the Laboratory of Inspectors of Cements, U.S.A., taken from the Cement and Engineering News, showing the percentage of superiority of NORTH AMERICAN PORTLAND over English and German Portland, and Natural or Rock Cements.

The reason as given by our eminent chemists and engineers for the superiority of American Portland Cement, lies not only in our superior raw material, but also in our modern improved method of manufacture. Natural or rock cements are lighter and weaker than Portland Cements because the natural conditions will not allow a proper mixture of the ingredients.



A Portland Cement Silo.

There is no longer a question of doubt as to whether ensilage pays; every careful investigator knows it does. The question to-day is—What sort of silo will serve best the purpose? Wood decays readily in such structures, ordinary masonry is not impervious to moisture, metal is expensive and corrodes, and none of these materials afford permanent structures or remain for any length of time air-tight. The above illustrated use of Portland Cement is therefore making strong appeal to the progressive stock-raiser.

For a cement silo is not affected by the juices of the silage, is non-corroding and impervious to moisture, and can be made absolutely air-tight to last for generations.

Various styles of construction are possible. The illustration above shows a silo built with expanded metal (M) imbedded in cement concrete (CC'). The hole broken in the side-wall shows the inner and exterior cement coats and the expanded metal embedded within the concrete mass.

Twenty barrels of Portland cement will be sufficient to make such a silo large enough to contain 100 tons of silage, providing for floor, walls, roof, and panels for closing door-way, all being made out of good cement concrete.

The High Quality of our Marl and Clay

THE quality and quantity of the materials in our property at Durham have been thoroughly examined and tested (hundreds of borings and analyses having been made) by the most eminent chemists in the country, especially fitted for this work; engineers have examined the splendid water powers, and the Company's expert has carefully examined everything in detail, and all report it to be a deposit of superior quality and perfectly adapted as to location for the business to be conducted successfully and profitably.

Chemists' Report

J. GODFREY DEAN, } Chemists.
N. S. POTTER,

Chemical Laboratory of the Peninsular Portland Cement Company, Jackson, Michigan

JACKSON, MICH., March 20th, 1901

National Portland Cement Company, Limited,
Toronto, Ont.

Gentlemen:

A thorough inspection of the property owned by The National Portland Cement Co. has been made, and over one hundred samples of marl have been taken at **regular intervals** at **different depths** which have been subjected to **chemical** and **physical** examination at this laboratory, and I herewith make my final report on the same.

1. The marl was found to be covered with water so shallow that **it can be dredged without any difficulty**.

2. There is but very little organic sediment overlying the marl so that it **would be unnecessary to do any stripping** before dredging for use at the factory.

3. The marl is found in a **very finely divided condition**, which is an admirable feature, since it will require but little grinding preliminary to calcination and therefore **cheapen cost of manufacture**.

4. **The marl is of the finest quality,** no better material having been analyzed at the laboratory. The chemical analysis which I include in this report shows it to be of **exceptional purity**, being very high in carbonate of lime and low in magnesia, sulphuric anhydride, and **contains no sand whatever**.

5. This marl when mixed with the proper amount of clay will, on calcination, produce the **finest grade of Portland Cement**.

The average percentage composition of the marl is as follows:—

Sand	None
Silica (SI O2)	0.40
Alumina (AL2 O3)	......
Iron Oxide (Fe2 O3)	0.70
Carbonate of Lime (Ca CO3)	98.05
Magnesia (Mg O)	.83
Sulphuric Anhydride (S O3)	Trace
	99.98

Clay is a decomposed orthoclase feldspar, consisting chiefly of silica and alumina, with smaller proportions of the oxides of iron, lime and magnesia. For the manufacture of Portland Cement, these proportions must be within certain definite limits, and the silica must be in a state of chemical combination, or what is known as "soluble silicate" and not in the form of free sand. Careful and exhaustive analyses of the clays submitted show that they include all of these very desirable qualities, while free sand is entirely absent.

I have also made the necessary computations to determine the proportions in which your marl and clay will need to be mixed in order to make cement, which, in its final completion, will be equal to that of the best Portland Cement now made. The composition of your cement is given in the table following, and for purpose of comparison, the chemical analysis of a sample of each of five leading Portland Cements is here shown:—

	National	Atlas American	Saylor's American	Lager Loring	Germania	American Sandusky
Silica	23.2	21.96	22.68	23.55	23.08	23.08
Alumina and Iron Oxide	11.1	10.96	9.06	9.87	10.20	9.06
Lime	63.6	60.52	62.30	61.99	63.72	62.38
Magnesia	1.2	3.43	3.41	1.42	1.32	1.21

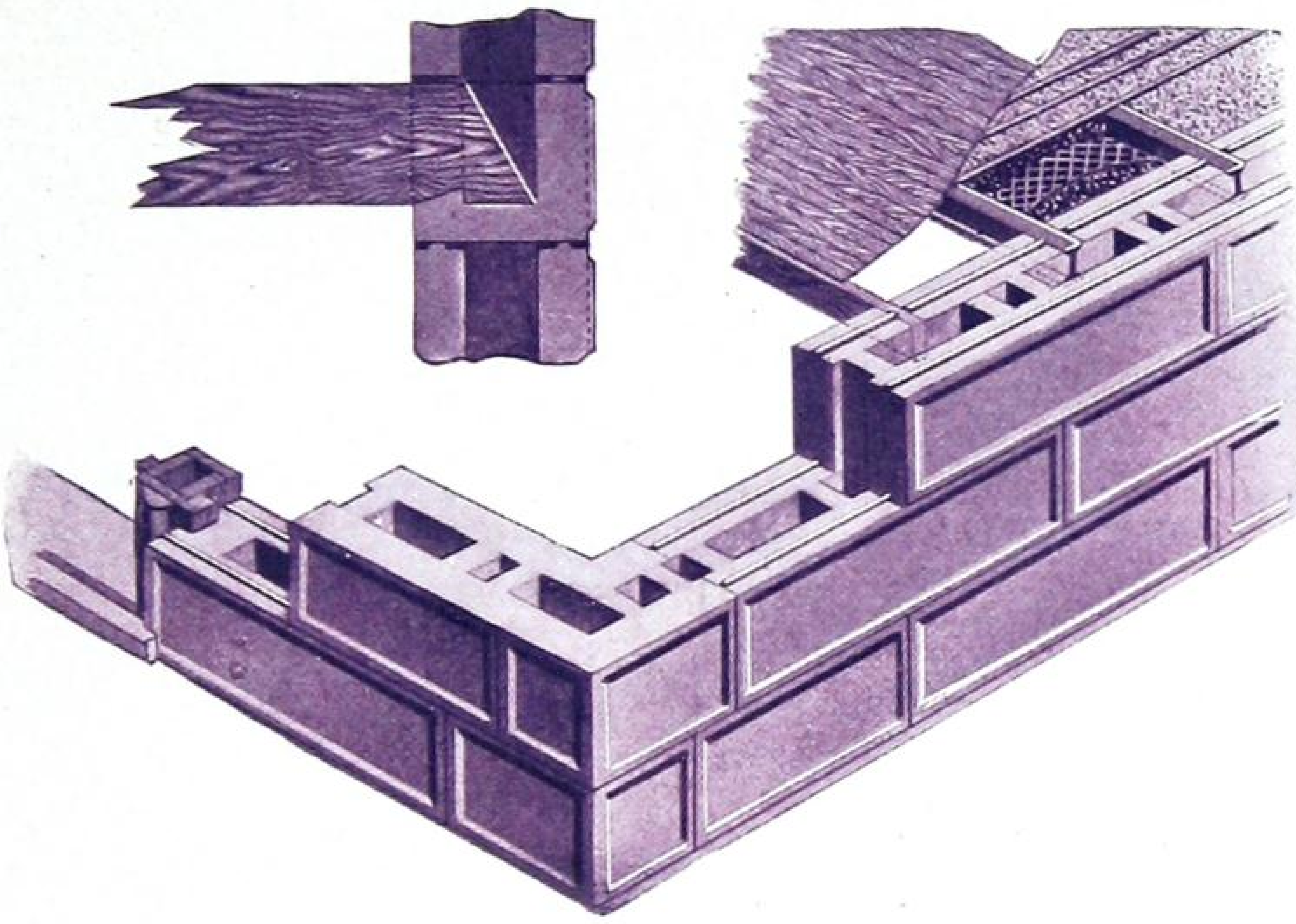
With this report I send you a sample of cement and a "briquette" of same, made in my laboratory, from your marl and clay and by the above formula. "Pats" and "briquettes" from this cement, when subjected to boiling water for several hours do not shrink or crack, but set quickly and harden slowly.

I therefore conclude that your marls and clays possess all the essential good qualities, and none of the poor ones, for the manufacture of the highest grade of Portland Cement

Yours very truly,

JOHN GODFREY DEAN,
Chemist.

Numerous other analyses have also been made by eminent chemists, including J. Walter Wells, B. Sc., Assayer and Chemist in charge at the Provincial Assay Office, Belleville, Ontario, under the direction of the Ontario Bureau of Mines, all of which show the deposit to be of exceptional value and purity in quality and specially fitted for the production of a high grade Portland Cement.



Sectional view of wall built out of hollow Portland Cement Blocks, showing air chambers in wall, method of inserting wooden joists or steel I-beams for floor supports, method of fire-proofing with cement imbedding expanded metal between beams and serving for floors above and ceilings below, or imbedding flush wooden strips on which, if desired, to fasten wooden floors and ceilings.

The St. James Church covers an area of over 11,000 square feet, and has four gables 60 feet high and a tower 80 feet high. It is built according to the Ransome monolithic system entirely of Portland Cement concrete imbedding cold twisted steel rods. It has an exterior appearance of rock faced massive granite; and from the standpoint of durability and beauty it is admitted to be much superior to a church that stands near by constructed of natural stone at three times the cost.—From "*Cement*."

ST. JAMES' CHURCH, BROOKLYN, N.Y.

Durham, March 27th. 1901.

To the people of Ontario and those who may become interested in
The National Portland Cement Company Limited.

Gentlemen:-

For some time it has been well known by citizens of our town that there is located, almost at our door, a large deposit of marl and clay suitable for the manufacture of a high grade Portland Cement. Our leading citizens have from time to time discussed the advisibility and the feasibility of organizing a company for the purpose of utilizing this rich material. With this object in view hundreds of samples have been taken from different locations and depths over the entire deposit, and submitted for analysis to some of the most eminent chemists of the Province and elsewhere including the Provincial Assayer, Mr. J. Walter Wells, the results of which prove beyond a doubt that our material is of exceptional purity and value. The report of eminent engineers and chemists who have made a personal investigation of the property, show not only the value of the material, but that it covers an area of several hundred acres, and is of great depth, running from twenty to sixty feet deep, and is of sufficient quantities to operate a thousand barrel per day mill for centuries.

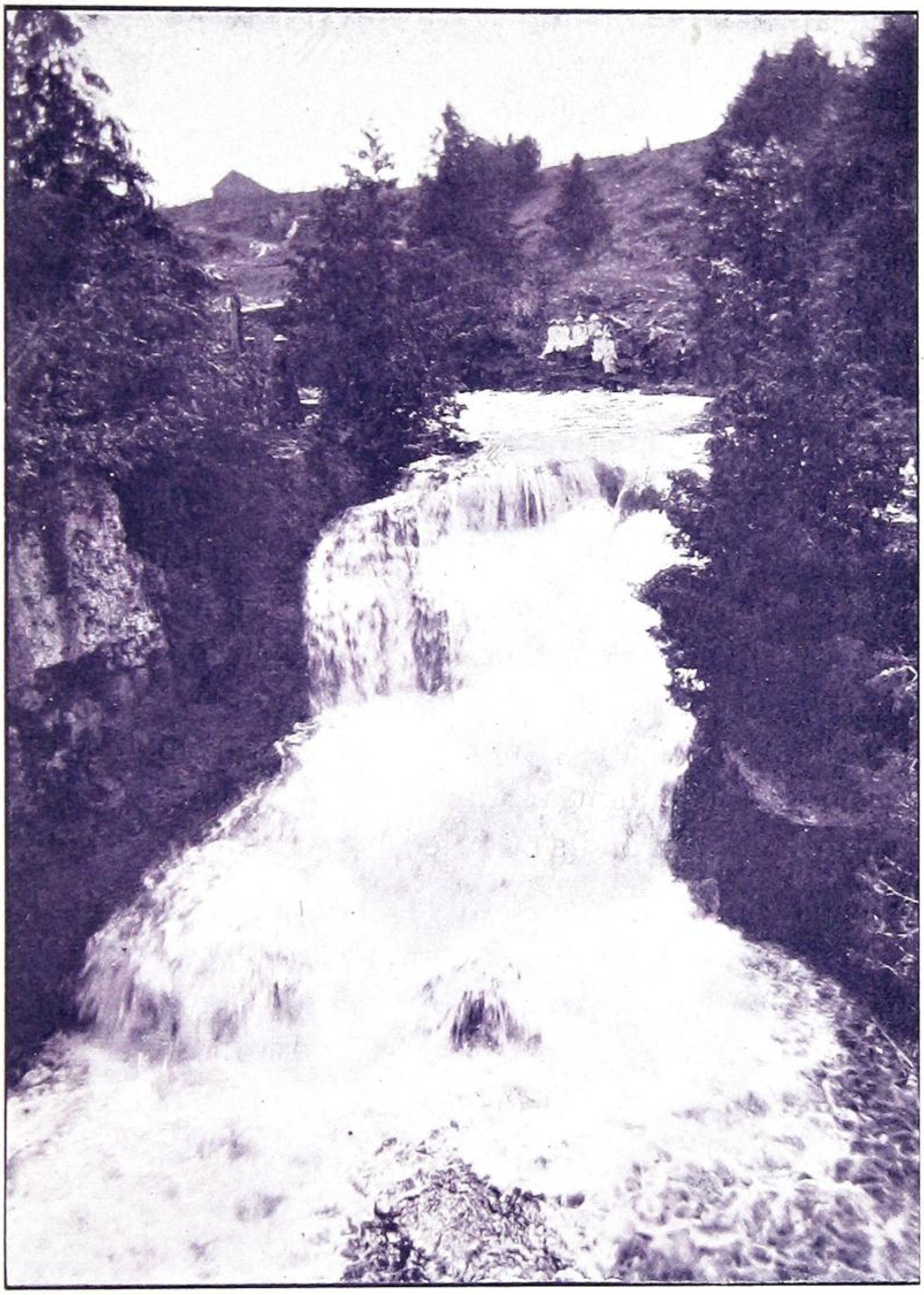
With reference to the mill site, the raw material is also exceptionally advantageously located, it being about two hundred feet above the level of the factory site, which will render it practicable to convey the raw material from its resting place to the factory cheaply and conveniently.

To be doubly sure, our citizens recently invited a noted staff of cement engineers to visit our property and make a thorough examination of our raw materials, water powers, mill site, etc. After receiving their reports steps were immediately taken which resulted in the organization of the Company now known as The National Portland Cement Company, Limited. The leading men of our town assisted in the organization of the Company, and as an evidence of our faith in the enterprise have guaranteed a free mill site, and exemption from taxation (except school tax) for a period of ten years, and the citizens of Durham have subscribed for upwards of $100,000 of its capital stock. We invite the people of Ontario and especially the prospective investors in this large and growing industry, to visit our town and a committee of our citizens will be pleased to show them the property, and assist them in any way possible to thoroughly investigate our materials, and the truth of our claim.

Yours very truly,

D. Jamieson, M.P.P.
Gilbert McKechnie, Ex M.P.P.
W. Calder, Mayor
W. Laidlaw. Ex. Mayor
Thos. Allan, Pri. Pu. School
F. G. Parker
W. Irvin, Publisher "Chron."
Con Knapp
[illegible] Lauder.
Dy. Reg. Surr.
John McKechnie
Neil McKechnie

Chas. McKinnon
Chas. Ramage
Pub. "Review"
A. W. Campbell. I.P.S.
Jake Kress.
William Caldwell
Timothy Moran.
J. W. Crawford
Arthur H. Jackson.



One of the Water Powers to be utilized by The National Portland Cement Company, Limited.

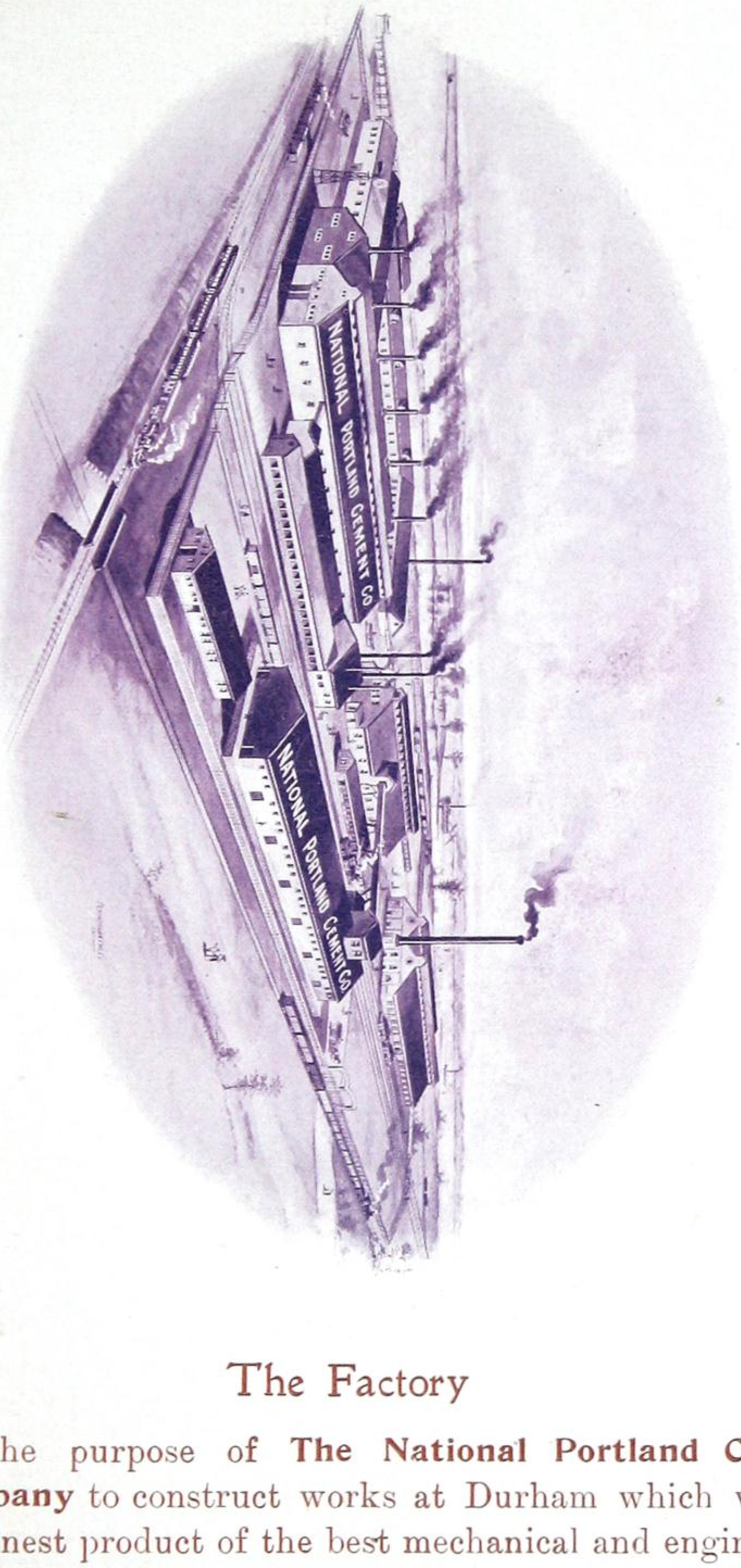
Power

NEXT in importance to the supply of raw material comes the question of power. In many cases the abundance of cheap power has been the main factor in the building up of large manufacturing centres, the saving in cost of power alone enabling manufacturers favorably located to survive competition which has proved ruinous to others. It is generally conceded by engineers that a good water power is at once the most reliable, the simplest and the cheapest of all forms of motive power. The power is always ready for use, the machinery is simple and requires little care, and the cost, after the first installation, is almost nothing. The saving over steam power for a plant of 1,000 barrels capacity should be not less than $25,000.00 annually.

The ideal arrangement for large plants is the generation of electricity by water power and the distribution of this electricity to motors located at convenient points for driving machines. This does away with the use of long and expensive shafts, and effects an additional saving of from 15 to 25 per cent. in the power transmitted. It, moreover, makes possible a much more convenient arrangement of machinery, since the power can be easily and safely led by wires to any point.

The National Portland Cement Company, Limited, have exclusive control of some of the best water powers in Canada, which, when properly developed, will yield many times the power required. The flow of the Rocky Saugeen River, which will furnish the power, is remarkably uniform, being free from seasons of high and low water, thus insuring an unfailing power throughout the year.

With such advantages in the way of raw material and of power, The National Portland Cement Company, Limited, should be able to produce a best quality cement at a manufacturing cost considerably less than it can be produced elsewhere.



Proposed Plant of The National Portland Cement Company, Durham, Ont. Capacity 1,000 bbls. per day.

The Factory

IT is the purpose of **The National Portland Cement Company** to construct works at Durham which will be the finest product of the best mechanical and engineering skill obtainable. The power generated is to be electrically distributed throughout the plant, which itself will be modern in every detail; the buildings will be models of convenience and equipped with the best and strongest types of machinery specially designed for this plant. Under these circumstances, a most economical and perfect grinding, mixing and clinker burning process is insured, and hence the best product obtainable. The National Portland Cement Company fully realize the magnitude of the undertaking and appreciate the expensive dangers of possible misguided judgment, founded upon lack of experience and knowledge, in connection with the construction and equipment of cement plants.

The **Official Report** of **The Bureau of Mines** for the Province of Ontario states that our manufacturers of cement have acquired their experience **slowly and dearly;** that of the factories now in existence, large amounts of money have been spent in processes and equipment which proved useless and costly experiments; that one factory spent five years of time and much money, aided by chemists and experts, before it was satisfied to start its works; and that another spent many thousands of dollars, a visit to some of the best Portland Cement Factories in Europe—where they were admitted as a special favor—and the services of two experts in the construction of a suitable plant before they could produce a commercial article. It is also well known that millions of dollars have been spent in Germany and the United States in learning and experimenting in the economical manufacture of a high grade Portland Cement; therefore **The National Portland Cement Company** believe they are especially fortunate in having associated with them a staff of the most practical and competent cement engineers in the country, who have designed and superintended the construction of many of the principal and best dividend-paying cement mills in North America, and who are recognized as leaders in cement manufacture; their last and crowning effort being the magnificent plant of the Peninsular Company at Cement City, Michigan, which is acknowledged by experts to be the **most modern and best equipped Portland Cement plant in the world.**

Toronto, March 27th, 1901.

The National Portland Cement Co., Limited,
Toronto. Ont.
Gentlemen:

With a view of becoming interested in the proposed cement plant to be built at Durham this coming season, we accepted your invitation to visit and make a personal inspection of the mammoth works of the Peninsular Portland Cement Company, which are located near Jackson, at Cement City, Michigan, and which have the reputation of being one of the finest cement plants in the world, and a duplicate of which it is proposed to construct at Durham, Ont.

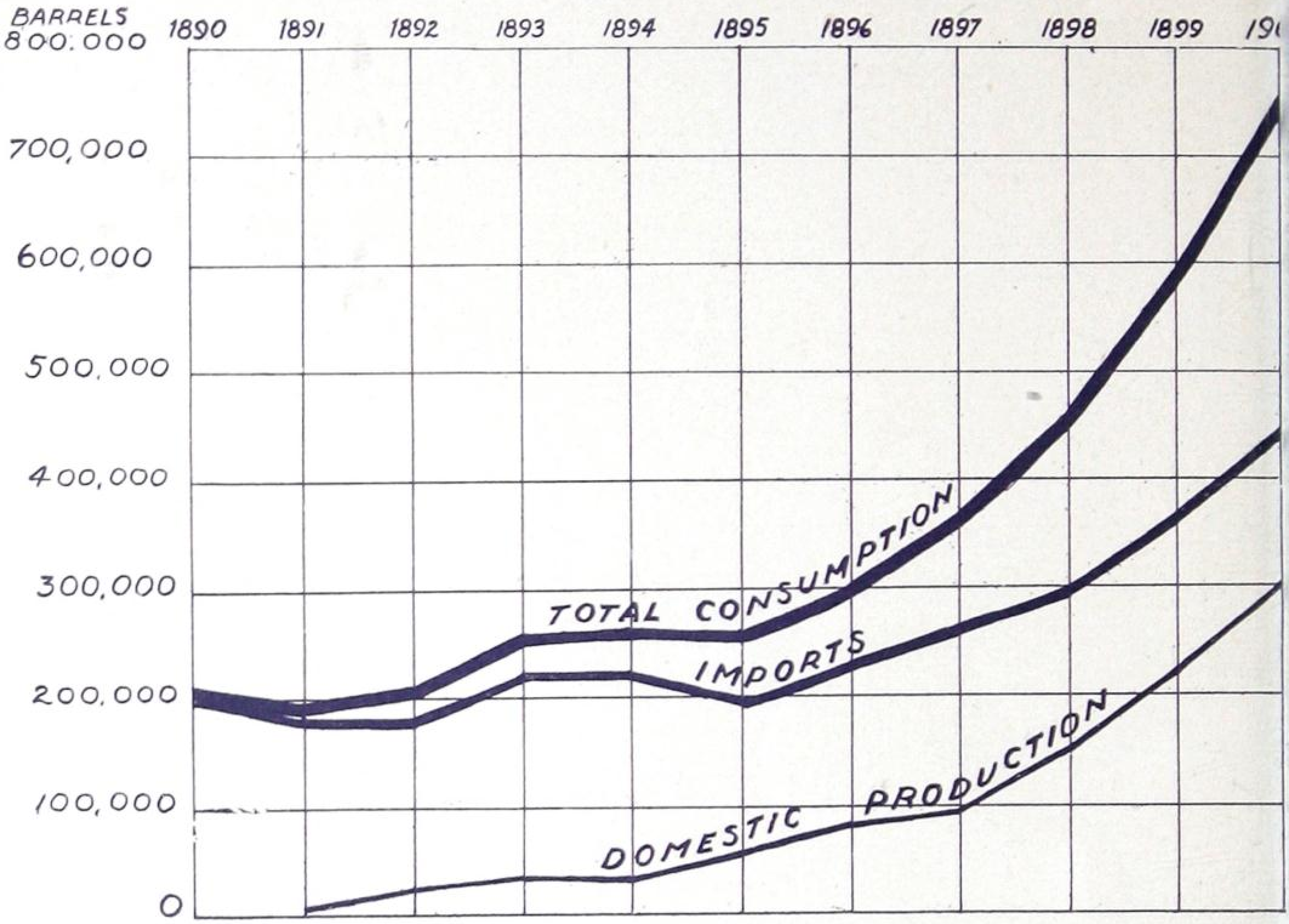
To those who may desire to become interested in The National Portland Cement Company, Limited, we beg to make the following report after a most thorough investigation of the Peninsular plant at Cement City:

The factory is modern in every detail and built most substantially, and has a capacity of one thousand barrels per day. The magnitude and extent of the plant is surprising and startling. The arrangement is perfect. The buildings, eleven in number, steel structures throughout, making them absolutely fire-proof, cover an area of about five acres of land, and are models of convenience, and equipped with the best and strongest types of machinery, specially designed for this plant, and are certainly the finest product of the best mechanical and engineering skill now engaged in that line of work, and we are informed, and believe from what we know of the business, this machinery to be larger, heavier, more substantial and of better design than ever before installed in a cement plant. The whole works is propelled by electric motors situated in convenient places throughout the plant, and is lighted inside and out by electricity. A noticeable feature in connection with the plant is the double system installed throughout. Everything seems to be so arranged as to avoid any possibility of a complete shutdown - duplicate machinery being installed throughout, to be used in case of accidents and repairs, and by reason of which it appears quite possible for a plant of this design to operate every day in the year. We find that these works are so designed and constructed that the machinery practically takes the raw material, marl and clay, from their natural resting-places, and carries them to the mill and through the entire process of manufacture and converts them into cement at the mouth of the barrel or sack into which it is to be shipped, without the aid of human hands. The machinery with which this result is accomplished is of special design, and built according to the plans and specifications of the staff of engineers in charge, who have had long years of practical experience in this particular line of work. The whole factory is a model of beauty and stability, and is, without doubt, the most modern and best equipped cement plant in existence.

The people of Durham and Ontario can surely congratulate themselves upon having located in their midst such a model factory for this new, growing and substantial industry, and a plant which, we believe, will produce the finest possible quality of cement at a minimum cost.

Very truly yours,

D. Jamieson, M.P.P.
Nelson Monteith, M.P.P.
S. J. Fox, M.P.P.
V. Ratz, Ex M.P.
A. F. MacLaren, M.P.
W. Calder, Mayor
Neil McKechnie merchant
C. Smith, Iron Founder
R. H. McWilliams, Lumber
J. A. Cody
S. H. Phippen
J. W. Thompson
John McKechnie
Arthur H. Jackson
J. B. MacLaren
W. L. McVey
E. W. Clarke, Owen
M. H. Pierce



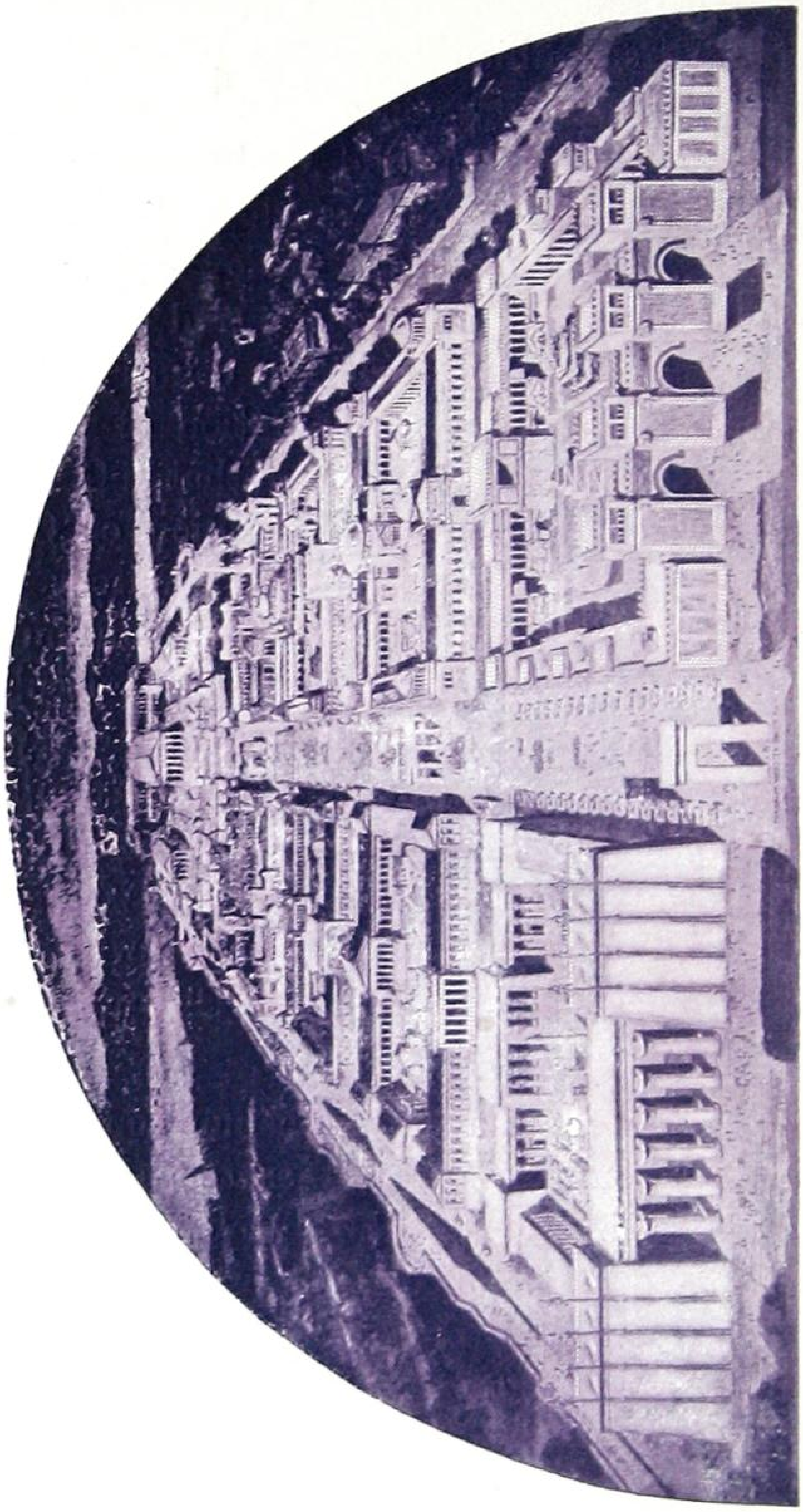
The above cut shows approximately the total consumption, imports and domestic production of Portland Cement in Canada each year for ten years.

Demand and Consumption of Portland Cement

THE supply of cement in Canada does not, by any means, approach the demand, much less the increasing demand, and as the industry is steadily winning its way forward in Canada as in other countries, there is yet considerable room for expansion in the industry at home, and its future in this country seems very promising indeed. The imports of Portland Cement in 1900 were about 400,000 barrels, the domestic production 300,000 barrels, and the total consumption over 700,000 barrels. Germany, with many years of experience in the manifold uses of Portland Cement (with only 1/17th the area of Canada, and less area than even the Province of Ontario), has over 80 Portland Cement Factories, which produce about twenty million barrels annually. The exports are about three million barrels, leaving seventeen million barrels as the quantity consumed in Germany per annum. The consumption of Portland Cement in Germany is therefore nearly twenty-two times that of the entire Dominion of Canada. In view of the far greater extent of territory and the magnitude of building and engineering operations to be carried on in this growing country, there is good reason to believe that the consumption of Portland Cement in Canada will eventually far exceed that in Germany; for it will be readily seen that the Dominion of Canada embraces throughout a large portion of its territory every facility of soil and climate calculated to maintain an immense population; it has a wealth of minerals, a fine agricultural country, and profitable fisheries, and with its admirable system of internal transportation and the industrious, temperate character of its people, and its solid and constant stream of immigration, the steady progress in social and commercial prosperity exhibited to-day is sure to increase with years, and hence this is indeed a **land of promise and one of progression.**

It is a noticeable fact that the consumption of **Portland Cement** in all countries of the earth is increasing rapidly. In the United States it has grown from about 2,000,000 barrels to over 12,000,000 barrels per year in the past ten years, and the present rate of increase is now about 2,000,000 barrels per year, and the industry is still authentically stated to be in its infancy in that country.

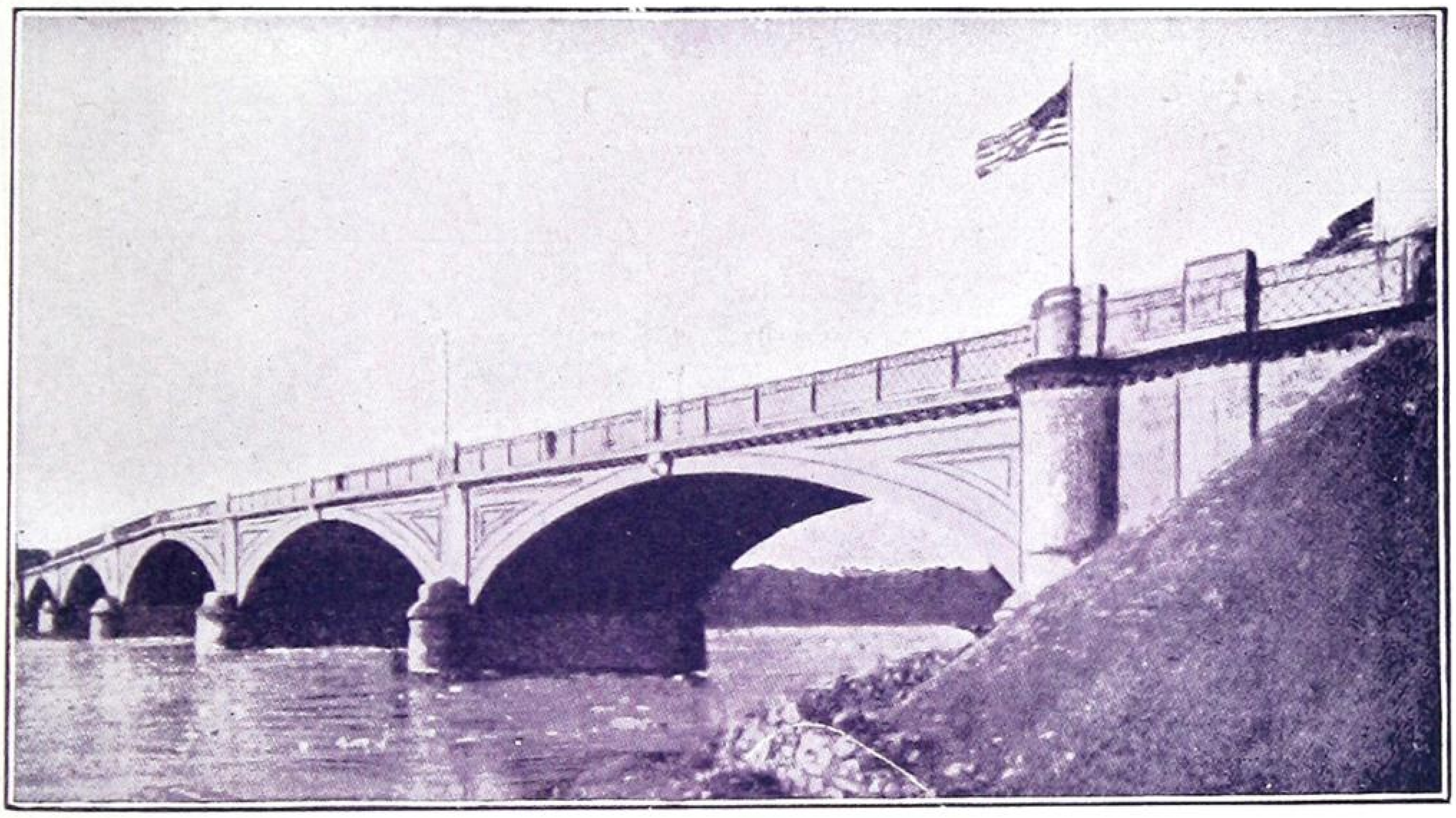
The total consumption of Portland Cement in Canada in 1900 exceeded that in 1899 by about 150,000 barrels. During the latter part of the year a veritable cement famine prevailed, and many important engineering works were delayed or suspended for lack of cement; in consequence, the actual amount consumed was considerably less than that required by the country. The same condition appears to have existed throughout the world, and is due to the **multitude** of new applications which Portland Cement is constantly finding,



National Galleries of History and Art, Washington, D.C., U.S.A.
Under process of Construction out of Portland Cement. Will cost when completed $10,000,000.
Would cost in stone $40,000,000.

and its rapidly increasing use in the place of brick and stone in construction of all kinds. A striking evidence of the growing demand in this country is afforded by a comparison of the consumption of cement in 1890 and that of 1900. In the former year the amount was about 200,000 barrels, and in the latter it was nearly 800,000 barrels (not including that used by the Dominion Government), being an increase of about 400 per cent. in the past ten years. **This is a rate**

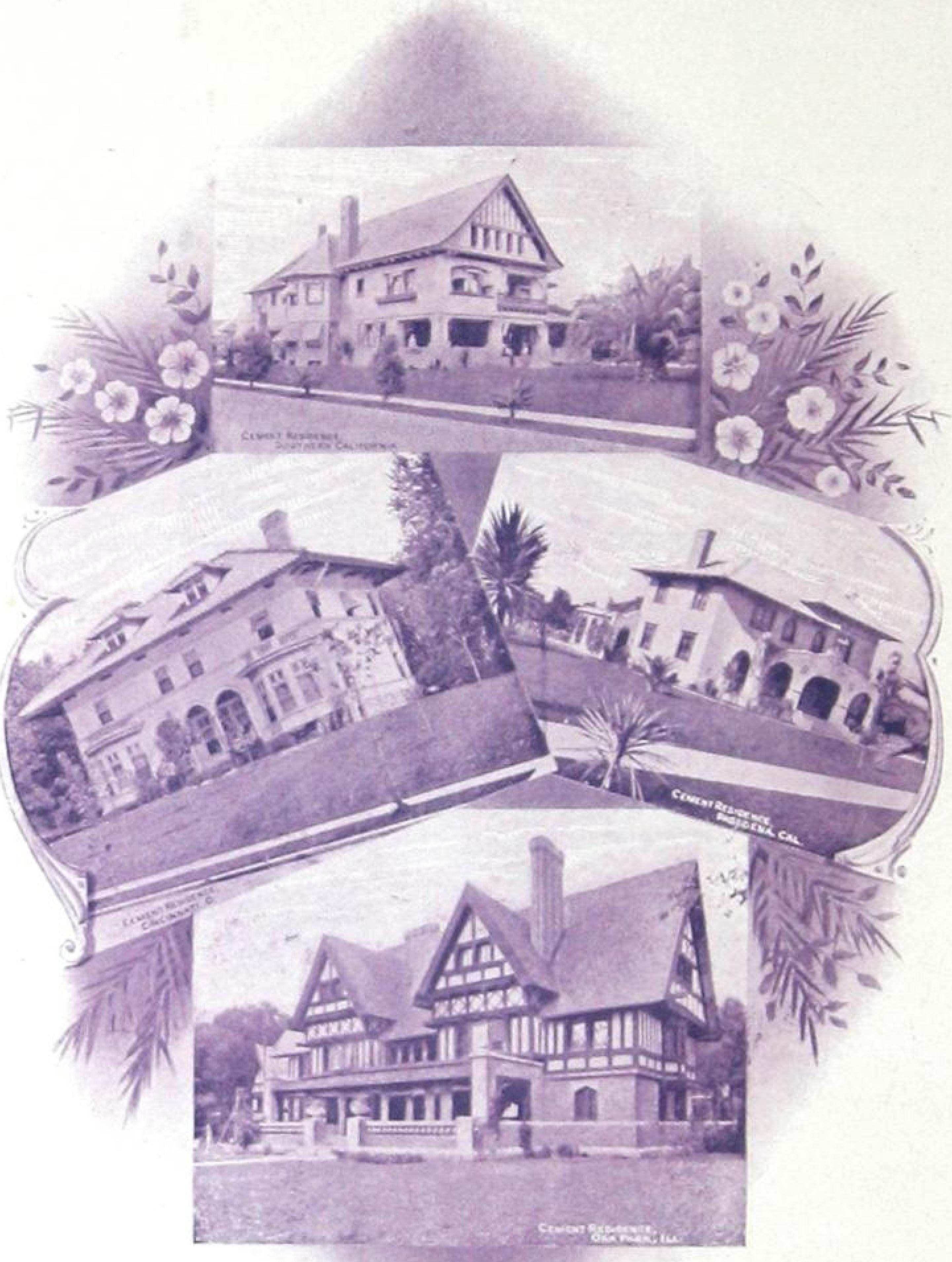
that perhaps has not been equalled by any other article used in this country, and as we are just now awakening to its manifold uses and superior qualities as a building material over all others, and its cheapness for construction, it is but reasonable to predict a much greater per cent. of increase of consumption for the future. It is absolutely certain that for many years yet to come the demand for Portland Cement will continue to grow as experience proves the utility and permanency of concrete construction.



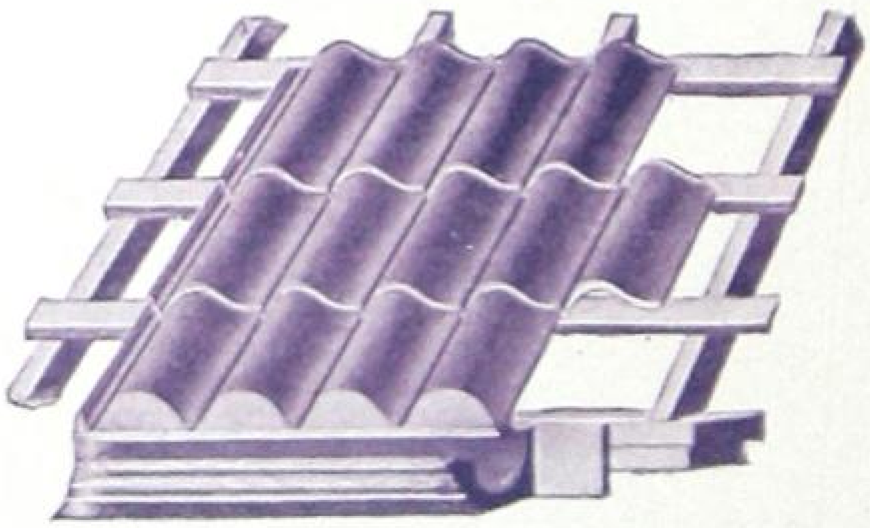
CEMENT BRIDGE OVER THE KANSAS RIVER AT TOPEKA.

The Topeka bridge is the largest cement concrete bridge in the world. It has five spans, the centre span alone having a clear length of 125 feet. For the purpose of saving the wing-wall foundations the construction provides at the ends cantilever wing-walls made of monolithic concrete. This bridge is of the Melan Arch construction.

The following instances of actual construction, and articles from recent newspapers, are evidences of the increasing use of Portland Cement:—


Cement Residence, Southern California
Cement Residence, Cincinnati, O.
Cement Residence, Pasadena, Cal.
Cement Residence, Oak Park, Ill.

CEMENT RESIDENCES.
Southern California, Cincinnati, Ohio, Pasadena, Cal., Oak Park, Ill.
These houses are built out of Portland Cement imbedding expanded metal.



ROOF TILE AND EAVES-TROUGH OF CEMENT.
Roof tile of cement are made under enormous pressure, and are more durable than slate or terra cotta tile, and remain unaffected by extremes of heat and cold.

FROM THE

Detroit News-Tribune

APRIL, 1900

Cement Dwellings

Any observer of building operations in this city must have been struck by Portland Cement sidewalks. This material is now being used for many purposes. It is rapidly displacing stone, brick, wood and terra cotta for dry-docks, fortifications, locks and dams, sewers, tunnels, kerb walks, fire-proof floors and even factory chimneys. The piers carrying two of the elevated railways of Chicago are constructed entirely of concrete. The Illinois Central Railroad uses concrete for its bridges, piers, abutments, retaining walls, culverts and other improvements where stone and brick were formerly used. The extension of its use to the construction of dwelling houses is but a step. At the present time Detroit parties are getting ready to build cement residences on the Cass Farm. The cost of these houses will be from 20 to 25 per cent. less than houses of stone or brick and they have the advantage of being more fire-proof than either of these materials. For instance, a brick and stone house costing $8,000 can be built of the material for $6,000. The cement building can also show architectural effects in ancient and modern styles at much less cost than stone carved by hand. The erection of these houses on the Cass farm will be an event in the history of Detroit buildings and will be regarded with great interest.

FROM THE

Cement and Engineering News

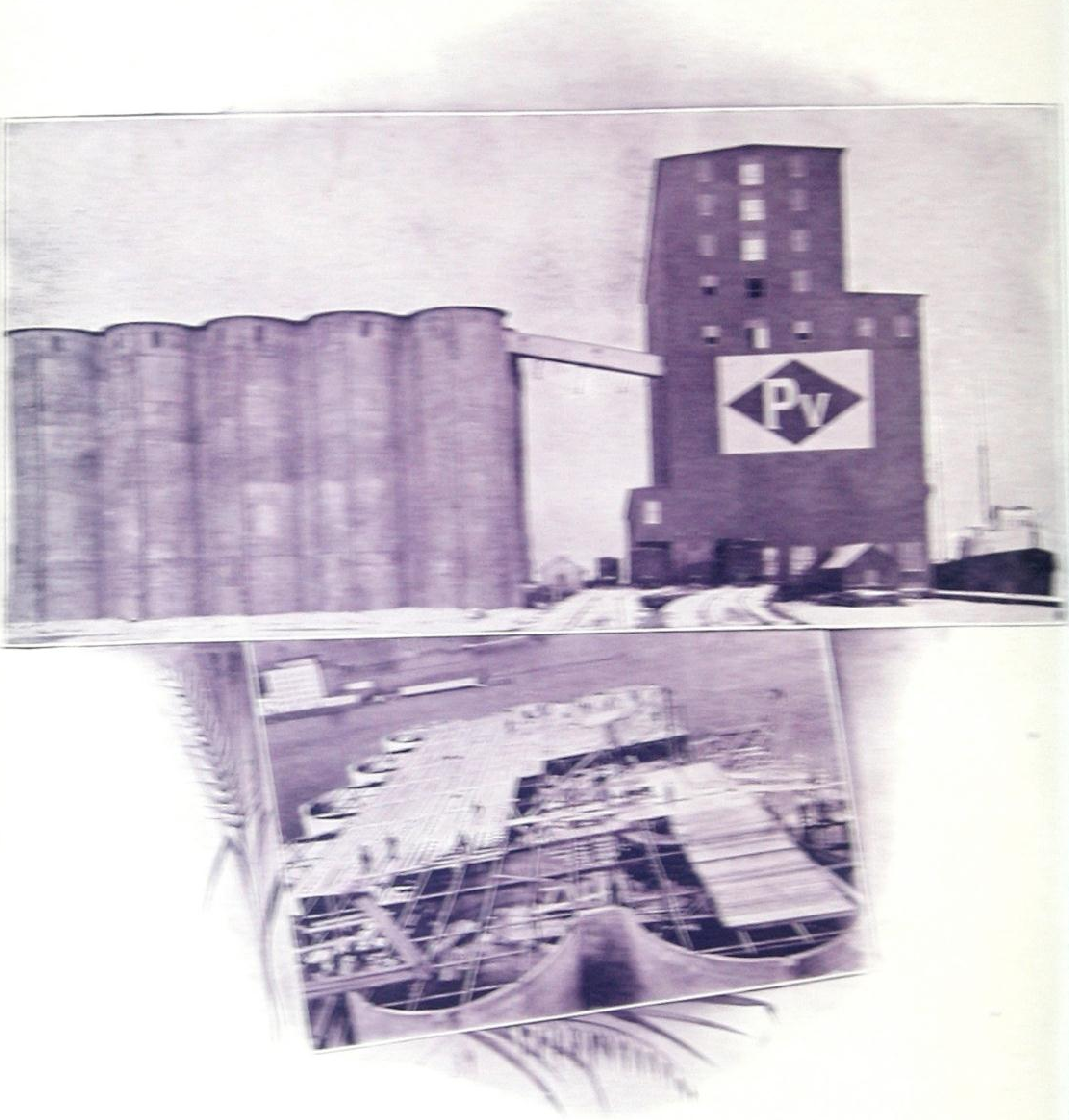
PUBLISHED MONTHLY

WILLIAM SEAFERT, PUBLISHER
16½ La Salle St., Chicago, Ill.

Portland Cement

The manufacture of Portland Cement is well established in the United States. The American product is in every respect equal to the European brands in strength, fineness and durability and with a demand far in excess of the output. The American system of manufacture yields a more uniform output, that is to say, a greater per cent. of the raw materials can be converted into a high grade finished cement than that made under the European process. European experts are, and have been, coming to America to study the rotary system of manufacture. The best manufacturers of cement-working machinery now employ American engineers to draw plans for Portland Cement works to be erected in Europe.

The use of Portland cement is rapidly displacing stone, brick, wood and terra cotta for dry docks, fortifications and gun emplacements, locks



Peavey Grain Elevator, Duluth, Minn.

These bins are 15 in number with capacity sufficient to hold about 2,000,000 bushels of grain. Each is over 100 feet in height and more than one-third as large in diameter. The entire structure is in Portland Cement concrete, and planned somewhat after European models that have given unqualified success for years. The work of construction was completed during the year 1900 at a cost approximating a half million dollars.

and dams, sewers, tunnels, culverts, foundations for office buildings, breakwaters, kerb walks, retaining walls for wharves, concrete piling, bridges over rivers and public highways, sidewalk, kerb and gutter construction, barn floors, fire-proof floors, roof shingles and tiles; factory chimneys are being constructed entirely of concrete, some over 150 feet high. Pipes for water service in cities, mill races and water-wheel housing, treacherous earth cuts along the line of railways are being covered with concrete. Reservoirs for city water supplies, fodder silos, grain elevators 150 feet high and 50 feet in diameter are in use in Europe, and one of nearly 2,000,000 bushels' capacity has recently been erected at Duluth, Minnesota. Concrete engine beds have almost entirely displaced stone and brick. The piers carrying two of the elevated railways in Chicago are constructed entirely of concrete, while the New York and London underground railways will consume many millions of barrels. Foundations for street pavements are coming in very extensive use. Concrete sewers are being constructed in many cities in Europe and the United States. Irrigating flumes and canals use large quantities of Portland Cement and the proposed Nicaragua Canal will consume many millions of barrels. The Illinois Central Railway, extending from Sioux City, Iowa, to New Orleans, La., uses concrete for its bridges, piers, abutments, retaining walls, culverts and other improvements where stone and brick have heretofore been used, and this example is being followed by many other railways.

The railways of India, Ceylon and Egypt erect their stations and approaches to the same out of concrete. In Germany 40 per cent. of the burnt clay roofing tile has been substituted by concrete tile during the past ten years. Concrete railway ties are coming into use in Europe and Oriental countries, and are being tried in the United States. Concrete blocks moulded in imitation of terra cotta are extensively used for external walls of dwellings and business houses.

Artistic tile are extensively used throughout Europe. The floors and wainscoting of the parliamentary buildings at Berlin Germany, are decorated with concrete tile as well as the private residence of the Emperor, and public libraries and other private and public buildings making pretentions to artistic effects.

Many of the best bridges of Europe are constructed of concrete and steel of the Monfer system, while several hundred thousand barrels of cement are used in single fortifications in Germany and France. Twenty million dollars worth of underground concrete work was under contract in England alone in 1900. Concrete railway fence posts are extensively manufactured in the United States and Europe.

Germany manufactures about 20,000,000 barrels of Portland Cement, and consumes about 17,000,000 barrels. England is importing cement from Belgium and Germany, and prices have increased in Europe, notwithstanding numerous large mills have been erected during the past few years. The demand has always been in excess of the supply. The trouble the past few years has been, with railroad engineers and contractors and the building trades in general, "Where shall we obtain the cement we require?" We are importing every barrel we can buy from Europe and still the supply is short.

A Great and Staple Industry

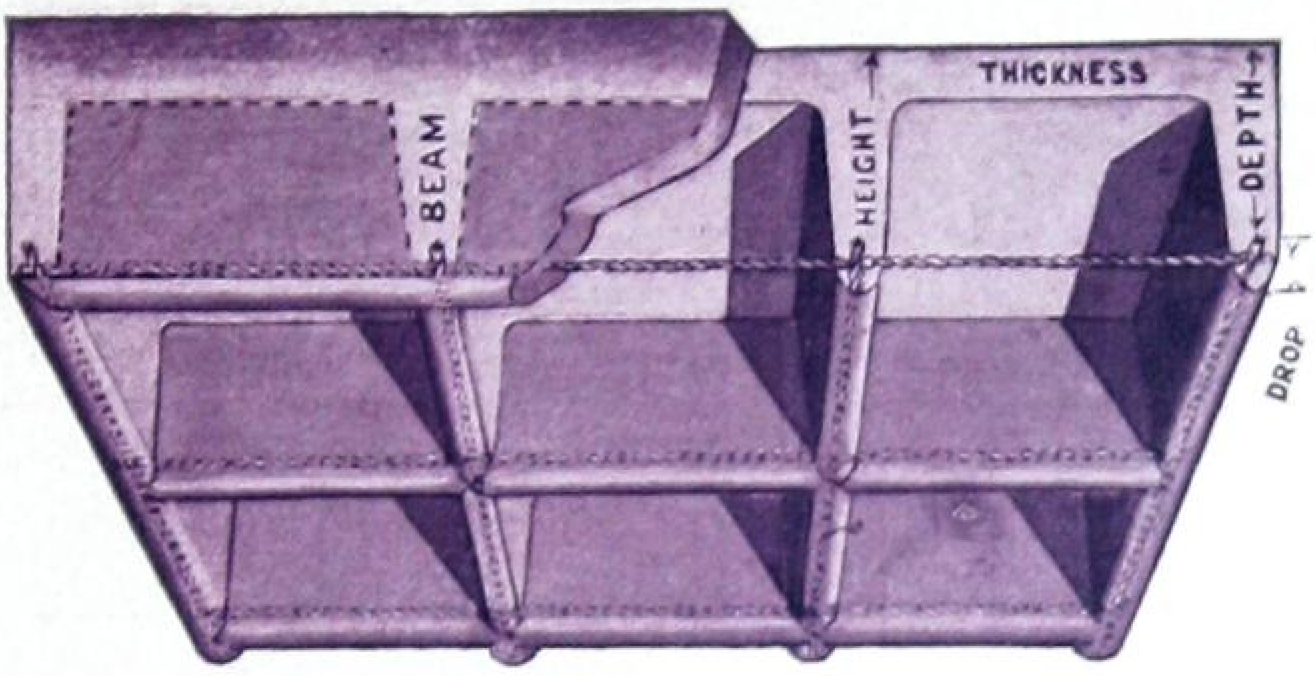
THERE are no elements of speculation entering into the manufacture of this article. It has been demonstrated by repeated tests and comparisons that the highest grade of Portland Cement known to the scientific world is produced from North American marl and clay. Our natural deposit at Durham is absolutely determined, both in quality and extent. Soundings and analyses have told the story unmistakably. We not only know that we have a mine, but we know **precisely what is in the mine.** Unlike a forest, our manufactured material cannot burn up or blow down. Unlike a mine, we are obliged neither to pump nor prop. Water is no obstacle. There is no prospecting to be done, no chances to be taken. In our marl beds there are known to be many millions of barrels of unmanufactured cement; there is therefore an unlimited supply of

HOTEL PONCE DE LEON, ST. AUGUSTINE, FLA.
GREEN HOTEL, PASADENA, CAL.

The walls of the Ponce de Leon are built of concrete made from Portland Cement and Coquina sand. This hotel is probably more widely known than any other in Florida.

The Green Hotel is a magnificent structure in Southern California. Its walls are cement concrete imbedding expanded metal. It is thoroughly fire-proof throughout.

the very best raw material. Our location is ideal. We are assured of the most improved machinery operated by engineers and workmen of long experience in cement manufacture, and everything necessary to make the highest grade of Portland Cement at a minimum cost, and as this article is the best known building material, and manufactured at less cost than any of its competitors (brick, wood, stone, terra-cotta, etc.), the market is unlimited, the profits large and certain, and hence the industry staple



Ransome Self-Sustaining Cement Floor.

This cut illustrates the method of constructing self-sustaining factory floors with large spans capable of bearing heavy loads. The Borax Factory Floors were constructed in this manner. Cold-twisted steel rods are embedded near the lower surface of the panels where they can best contribute to the tensile strength of the combination.

Communication

Toronto, April 11th, 1901.

The National Portland Cement Co. Limited,
Toronto, Ont.

Gentlemen,-

In answer to your enquiry I might say, that after an experience of some twenty years I am stronger of the opinion than ever that no building of any importance, where either stability or strength is required should be erected without using Portland Cement as the plastic element in its construction. I have used it extensively in connection with concrete foundations and the building of walls of buildings, and all cases where I have examined for results it has justified its use to me by the great benefits shown by giving the work a more permanent and lasting life.

I might mention that I have used in the last few years about 40,000 barrels of Portland Cement in connection with my important buildings in this city, so you will see the confidence I have in using first-class Portland Cement. I am firmly of the opinion that there is a growing demand for its use.

Yours respectfully,

E. J. Lennox
Architect

KURSTABELLE

AKTIEN

NAME	DIVIDENDE		GESCH JAHR	KURS	
				1900	
	1898	1899		27/8	28/8
Adler, Deutsche Portl.-Cem.-Fabr. conv.	14	25	1/1	170.00 bzG	171.00 bzG
Alsen'sche Portland-Cement-Fabriken	21	25	1/1	214.00 bzG	214.00 bz
Deutsche Steinzeugwarenfabrik	13	17	1/1	280.50 B	280.50 B
Portland-Cement-Fabrik Hemmoor	15	15	1/1	129.80 bz	129.40 B
Porzellan-Fabrik Kahla	24	25	1/1	314.00 G	312.00 bzG
Lothr. Cementwerke	12½	14	1/1	169.75 G	167.75 G
Nauheim, Fabrik säurefester Produkte	15	15	1/1	150.60 G	150.50 bz
Porzellanfabrik Königszelt	14	14	1/7	192.75 G	191.00 bzG
Stettiner Chamotte-Fabrik (Didier)	25	30	1/1	334.00 bzG	331.25 bzG
Vorwohler Portl.-Cem.	18	18	1/1	179.00 G	174.10 bzG
Westfalia, Portl.-Cem.-Fabr. i. Beckum	33	25	1/1	189.00 bz	185.00 bzG
Schlesische A.-G. f. Portl.-Cementfabr	17	17½	1/1	157.50 G	157.00 B
Portland-Cementfabrik Gössnitz	15	20	1/10	not reported	not reported
Ziegelei Augsburg i. Augsburg	10	15	1/12	325.00 G	330.00 bz
Porzellan-Fabrik Kahla i. Kahla	24	25	1/1	318.00 bz	not reported
Porzellanfabrik Kloster-Genussscheine	17½	21¼	1/1	not reported	not reported
Sächs. Ofen- u. Cham.-F. (E. Teichert)	24	25	1/1	not reported	not reported
Hannoversche Portl.-Cem.-Fabr. A.-G.	20	25	1/1	170.00 B	170.00 B
Portland-Cementfabrik vorm. Heyn Gebr., A.-G., i. Lüneburg	16	18	1/1	147.00 bB	145.00 bB
Vorwohler Portl.-Cem.-F. Planck & Co	18	18	1/1	180.00 B	180.00 B
Actien-Ziegelei München	12	15	1/1	885.00 G	not reported
Mechanische Backstein-Fabrik	16	10	1/1	not reported	850.00 G
Cementfabr. Groschowitz	17	17⅛	not rep	not reported	not reported
Stettin-Bredower Portland-Cementfabr	12½	14	1/1	140.00 bz	140.00 G
Wickingsche Portl. C.-F. Recklinghaus	16	13	1/1	not reported	not reported
Schwarzmeer Cem.-Fabr.	45	40	1/1	320.00 B	320.00 B
Gluchoosersk.-Ges	40	not rep	1/1	300.00 B	300.00 B

Profits

CAREFUL investigation of the Portland Cement industry in all countries proves conclusively that it has been universally a profitable and staple business. The splendid dividends made by even some of the present crude and poorly equipped mills in this country are too well known to require publication here. Germany, a cement exporting country, with most of its product still manufactured under the old crude and extravagant system, laboring also under the disadvantages of sharp competition in prices, heavy export shipping rates, coupled with the payment of immense duties and tariffs in order to sell her cement in foreign markets, all of which tend materially to decrease the earning power, has always made handsome dividends on her cement properties, as is shown by the table on page 28, taken from the authentic report of the Thonindustrie-Zeitung of Berlin, Germany, relative to the dividends paid in 1898 and 1899 and the market price of stock of some of the German Portland Cement plants on August 27th and 28th, 1900.

The United States has also universally good paying cement mills, as will be seen by the following articles from the Press of that country.

American Cement

It is generally conceded that securities based on the Portland Cement industry have a very promising future in view of the broadening field for operation of the companies. Stock of the American cement companies, it seems to many, is a very attractive purchase around current quotations. But very little of this issue, however, comes on the market, due to the fact that it is closely held by investors.—*Stockholder*, Philadelphia, Pa., Feb., 1900.

Sale of Big Cement Plant

The biggest cement deal in the history of this industry was consummated to-day in the sale of the plant and property of the Coplay Cement Company. The concern will shortly pass into the hands of the new owners, who are Philadelphia and London capitalists. The syndicate purchased all the stock of the Company. The par value of the latter is $50 a share, and on this the Company has for some years been paying an annual dividend of 32 per cent.—Philadelphia (Pa.) *Times*, May, 1900.

A Good Business

The fire in the plant of the Glen Falls Portland Cement Company on Sunday caused a loss of $300,000 and threw 500 men out of employment. The Glen Falls Cement Company was organized in 1893, and incorporated under the laws of the State of New York. The Company has been doing a very profitable business, and last week its stock sold at $170 for $100 share.—Decatur *Evening Journal*, April, 1900.

Large Earnings

The gross business of the American Cement Company of Philadelphia, for the four months ending March 31, shows an increase of 18 per cent. over the corresponding period of last year. The balance sheet showed a surplus of quick assets over current liabilities of $243,000.—*Cement and Engineering News*, May, 1900.

It will be understood that the above mentioned American plants were working under serious disadvantages which will not be encountered by The National Portland Cement Company, Limited, as we have no limestone rock to blast, mine, transport, grind, etc., all of which is an expensive process. On the other hand, our raw material is found in its native resting-place in a condition ready to deliver directly to the mill for immediate mixing and burning, without any expense of preparation whatever, and when it is understood that the plant of The National Portland Cement Company, Limited, will be equipped with the very latest improved machinery, instead of the old crude and expensive system of manufacturing, and that the material will pass through the entire process of manufacture without the aid of human hands, it must certainly appear even to the most criticizing and conservative business man that the cost of manufacture will be greatly reduced, and that the profits and earnings of The National Portland Cement Company, Limited, should at least equal the earnings of the mills referred to.

Taking into consideration and estimating simply the amount actually saved by our splendid system of manufacturing, together with the amount saved in preparing for mixing and burning, by reason of the natural condition of our raw material, we find it impossible to figure the profits even as low as the highest indicated by any of the factories above mentioned.

From the foregoing, and from the most conservative estimates, we are entitled to the conclusion that the earnings of the National Portland Cement Company, Limited, should be **far in excess of that of any other mill in existence to-day.**

With our indestructible natural resources, perfect economical powers, plant of the very best possible mechanical equipment, ready means of transportation, competent management, ideal location, a staple article and an ever-growing unsupplied market, The National Portland Cement Company is commanding the attention of the thoughtful, conservative business man and investor.

There is to-day no line of investment that promises more certain or more permanent return on capital invested, not one where the absence of speculative features is more marked than in connection with the production of Portland Cement.

The people of Durham have furnished a free mill site, have insured the Company exemption from taxation (except school tax) for a period of ten years, and have subscribed for upwards of $100,000 of the capital stock of the Company. $250,000 of the capital stock has been taken by the Directors and others interested in the Company, and considerable other amounts have been subscribed for throughout the Province of Ontario. The balance of the stock is now offered for subscription in the various cement consuming centres of the Dominion of Canada, so that the Company may be properly represented for business purposes in the territory in which it is desired to establish a permanent market.

THE MANAGEMENT of the Company will be under the control of men well-known in financial and business circles, whose connection with the enterprise establishes its position and assures its success.

Mr. James P. Langley, Chartered Accountant, Toronto, Ontario, has undertaken the audit of the Company's affairs, and will certify to the correctness of all accounts.

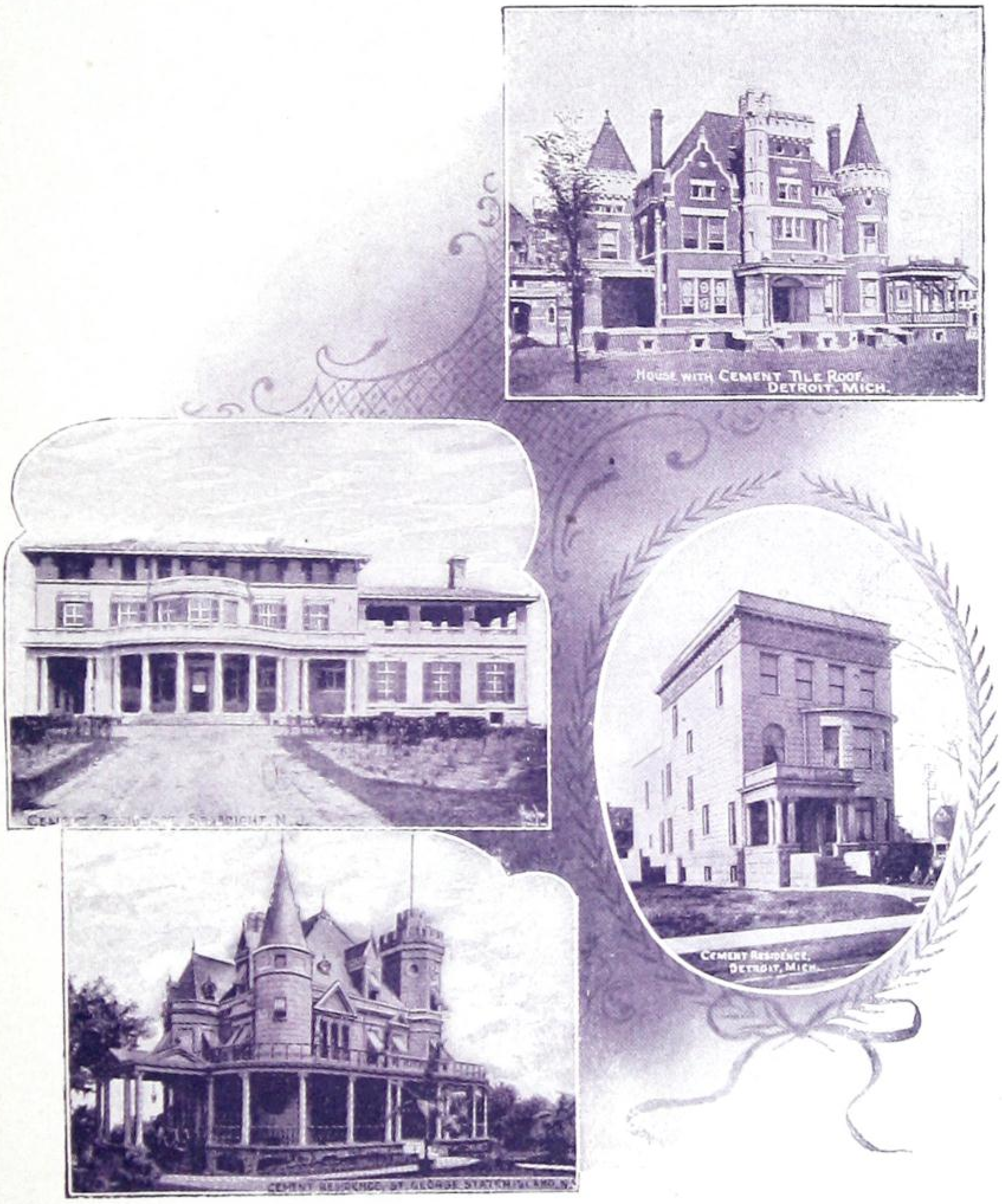
The Officers and Directors are elected annually by the stockholders of the Company, thus ensuring safe and conservative management in the administration of its affairs.

APPENDIX

THE remaining pages of this book will be devoted to illustrating developments and modern adaptation in the use of Portland Cement, taken from photographs of actual cement building and structural work—which illustrate not only what is to be, but what is actually now in existence. Extracts from the Press will also be contained herein, together with the opinions of eminent architects, engineers and builders relative to the merits of concrete construction and its present and future use.

Mr. Jas. Renwick, of Renwick, Aspenwall & Russell, a prominent architect of 71 Broadway, N.Y., says:—"Cement concrete not only outwears sandstone, but equals marble or granite in its durability and will be used much more largely in future. as it is, in addition to its durability, the cheapest known material. If mixed by machinery the walls of a building can be built for 10 cents less per cubic foot than ordinary brick work."

The museum of Stanford University, California, will be the most important edifice on the ground. It will be 300 feet long, three stories high, and the entire structure, walls, floors and roof, is to be of Portland Cement concrete and twisted iron.


House with Cement Tile Roof. Detroit, Mich.
Cement Residence, Seabright, N.J.
Cement Residence, Detroit, Mich.
Cement Residence, St. George, Staten Island, N.Y.

Cement Residences.

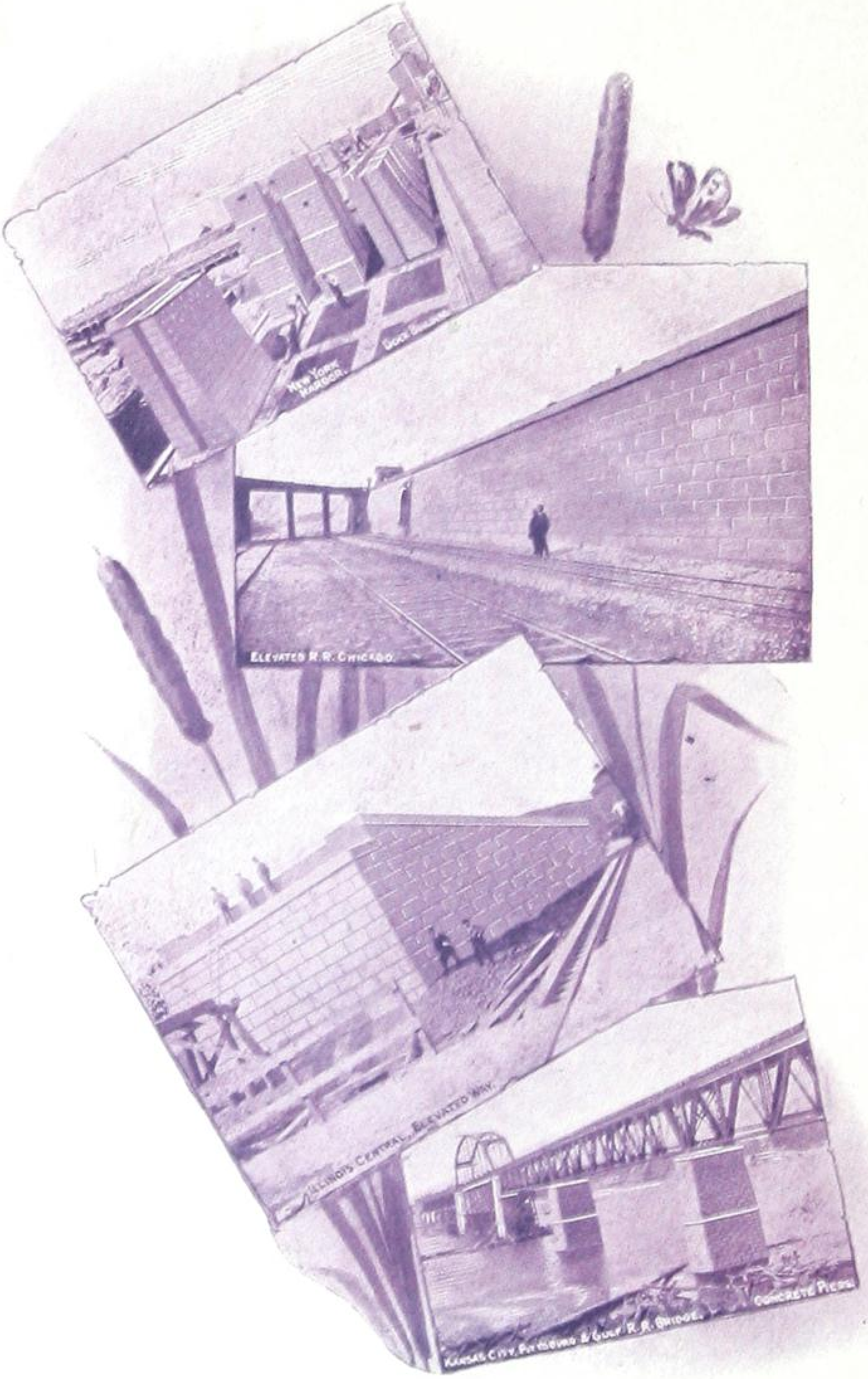
Seabright, N.J., Staten Island, N.Y., and Detroit, Mich.

"Portland Cement, one of the greatest constructive materials ever placed at the disposal of the architect, the engineer and the builder."—C. T., in *Building News*.

Passing of Stone Age

GENERAL J. S. CLARKSON SAYS CEMENT IS NOW IN DEMAND.

"The stone age is passing, and the age of cement is upon us," said General J. S. Clarkson at the Auditorium yesterday. "American cities are in the rough, and they must in the next few years be completed so that they will be safe and sanitary. The work of development will be done in great part with Portland Cement. That will be the material for bridge piers, for foundations of buildings, for conduits, and for the tunnels in which underground transportation will in time be placed."


NEW YORK HARBOR.
DOCK BUILDING
ELEVATED R.R. CHICAGO.
ILLINOIS CENTRAL ELEVATED WAY.
KANSAS CITY, PITTSBURG & GULF R.R. BRIDGE.
CONCRETE PIERS.

Dock foundations, retaining walls, abutments, and piers above shown are all constructed out of Portland Cement.

General Clarkson was formerly the Warwick of Iowa politics, but now he is a resident of New York. As President of the New York and

New Jersey Bridge Company he is doing much work to bring about the rapid approach of the cement era of modern cities, in which he believes.

"Our own crying need for quantities of cement is for use in the towers of our Hudson River bridge. The Hudson is an old arm of the sea, and 160 feet of silt is deposited in its bed. To secure foundations for the towers we must sink through this silt to rock bottom. Our caissons, the modern substitute for the coffer dam, will be filled up with cement and will form the basis of the towers. The towers themselves, in order to carry the vast span of the bridge, will be thirty five feet taller than is the Washington monument, so you may imagine what quantities of cement will be required.

This monument is 24 feet high, 14 feet wide, 6 feet thick, and contains over 80 tons of Portland Cement concrete. It has 22 medallion heads around the base and 6 full length statues above. The monument is one solid mass without break or joint, cast where it stands entirely from Portland Cement and required less than three days chiselling and dressing to put it into presentable form. It is the work of the sculptor Warren S. Cushman, of Bellefontaine, Ohio.

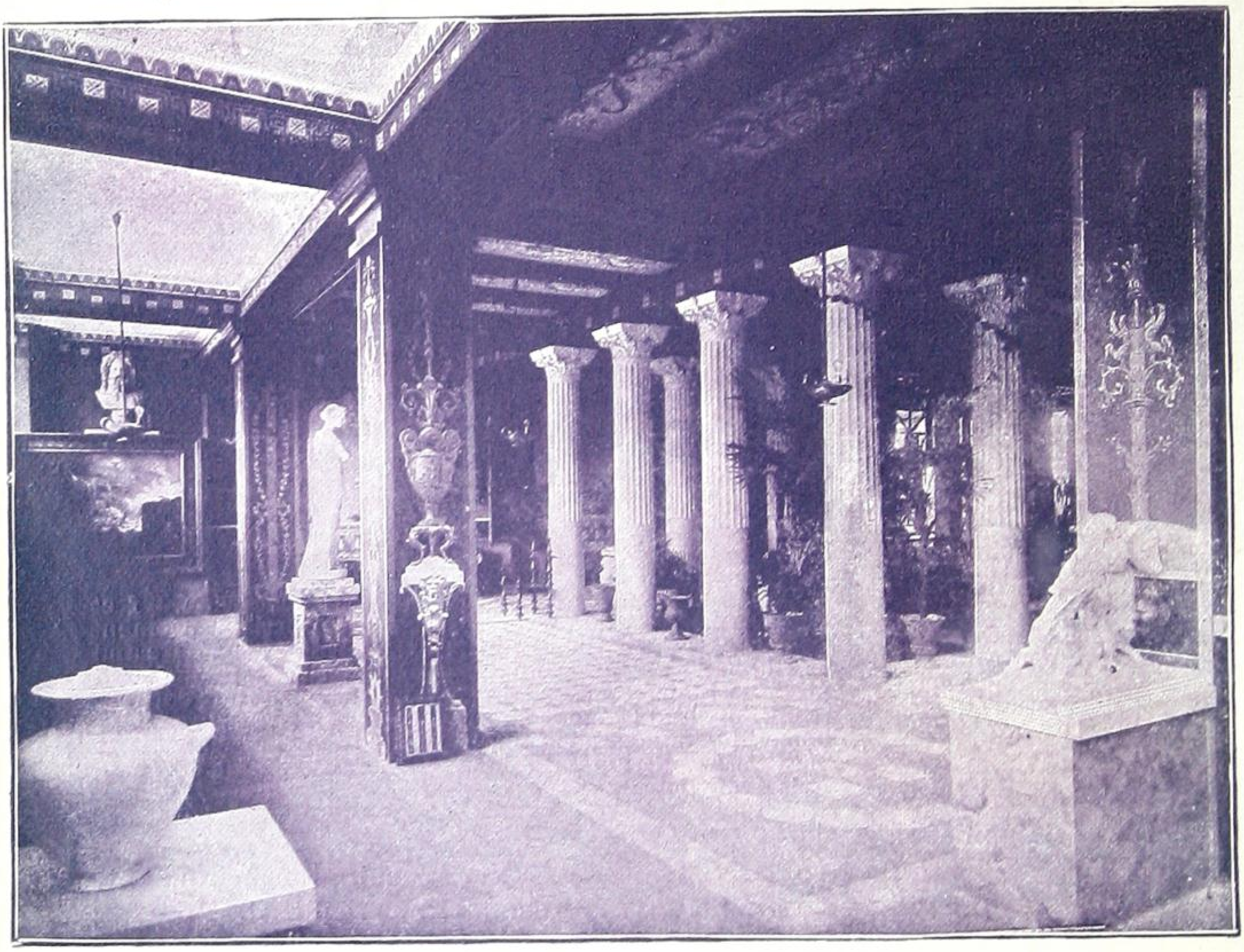
"The bridge will cross the Hudson River from Weehawken, on the Jersey side, to Fifty-ninth street, in Manhattan. Its span will be 2,800 feet long, exactly twice that of the Brooklyn Bridge, and its arch above the river 160 feet above high tide. The bridge will carry eight railway tracks on its lower level, and on the upper roadways, tramways, and a bicycle path. Work will be commenced inside of twenty-four days. The contract was let at a figure of $23,000,000. . . . .

"As I said, cement is taking the place of stone. Our bridge, gigantic as it is, is but a fraction in the municipal improvements which are under way. We must complete our cities, make them sanitary, safe and finished. In this work Portland Cement will be the largest contributor." —Chicago *Times Herald*, April, 1900.

Pittsburg is considering the erection of a filter plant to cost $2,500,000, or over. The specification calls for 23,200 cubic yards of cement concrete in the walls, figured at $127,000 and 23,700 cubic yards for the floors and drains, figured at $142,000.—*Cement and Engineering News*, Chicago.

Cement will Displace Wood in Buildings

The lumber supply of the country is fast becoming exhausted, and the people will naturally be compelled to turn to some substitute presenting durability as well as cheapness. Portland Cement offers an admirable substitute, and people are beginning to realize that inventive genius has afforded them a clear solution for the builders of this and future generations. Many of the large buildings of the world are made almost wholly of Portland Cement.—The *Chicago Record.*



Peristylium in the Roman Reproduction, Halls of the Ancients.

Reproduction in cement of the Roman House of Vettius in the Halls of the Ancients, Washington, D.C. This house was a model of Roman luxuriance and elegance exhumed at Pompeii in 1895. More than one hundred photographs and colored transcripts of the paintings on the walls of the exhumed house, as well as the ground plan and numerous casts of objects found in the house, are incorporated in the Washington reproduction, a part of the National Galleries.

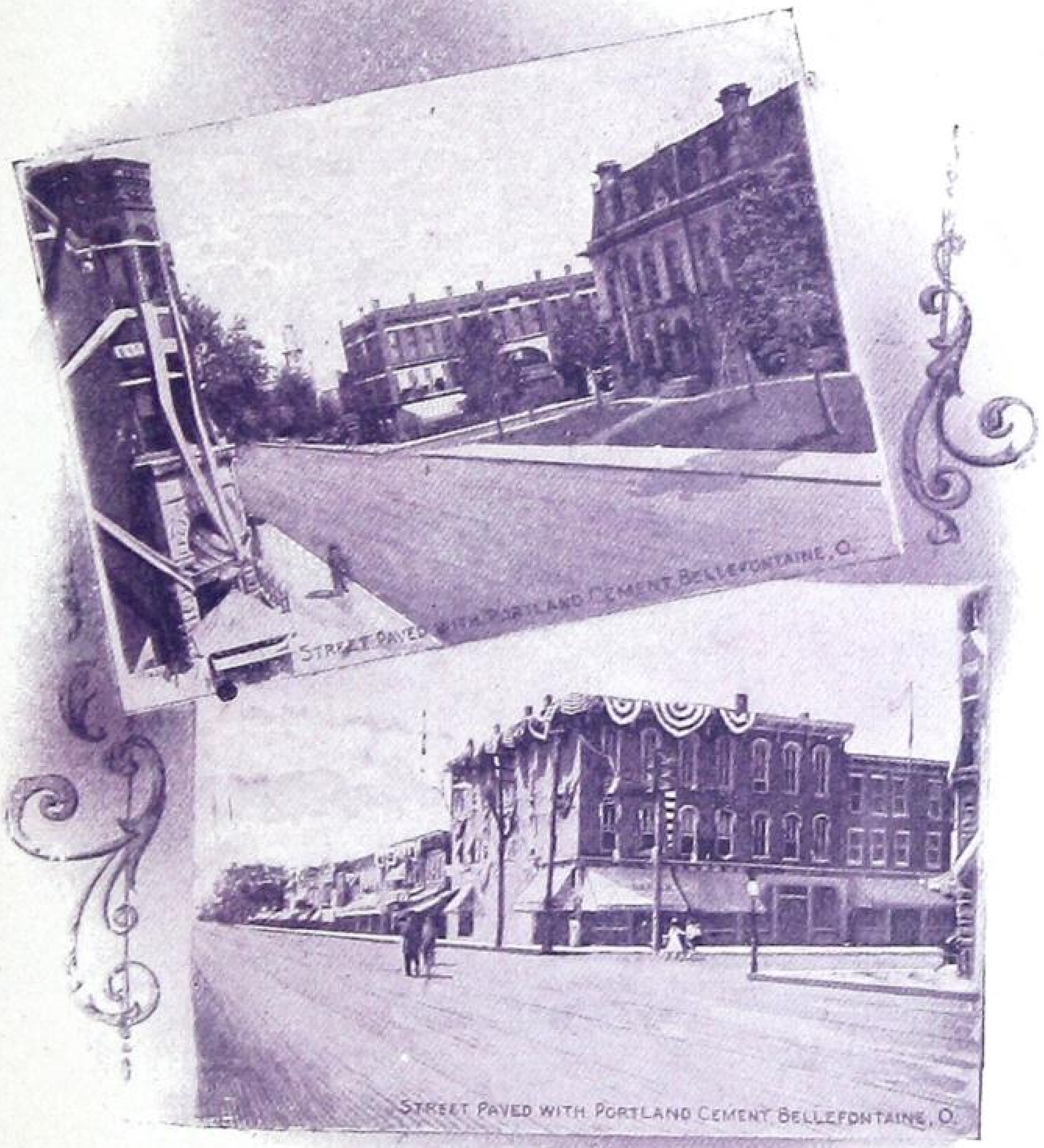
More than 70,000 barrels of American Portland Cement have been consumed in the construction of the Great South Terminal Station at Boston and 50,000 barrels in the Reading Terminal Station, Pa.; 45,000 barrels of Portland Cement will be required for the Holyoke dam, at Holyoke, Mass., now under construction. This dam will be 1,020 feet long and 35 feet high.—*F. G. Jonah, M. Can. Soc. C. E., Canadian Engineer.*

The Krause & Sons Cement Co., of Martin's Creek, Pa., have a contract with the United States Government for the delivery of 30,000 barrels of Krause Portland Cement for the new Bureau of Printing and Engraving Building, Washington, D.C.—*Cement and Engineering News*, Chicago.

Detroit City Engineer's Recommendation Regarding Paving

"Portland Cement is the best, its durability is beyond compare, and because of its undoubted superiority should be adopted for all Detroit's public work," said City Engineer McCormick. Mr. McCormick has communicated to the Board of Public Works the above opinion, together with the confirmatory statistics, with the recommendation that the Board ask the Common Council to provide in the specifications to be adopted for paving, that none other than Portland Cement be used.—Detroit *Free Press.*

The Report of the Bureau of Mines for Ontario states (among other things) that concrete is the street engineer's material for street building, and his chief reliance in the making of it is not Roman or any other kind of natural cement, but the stronger and more durable Portland.

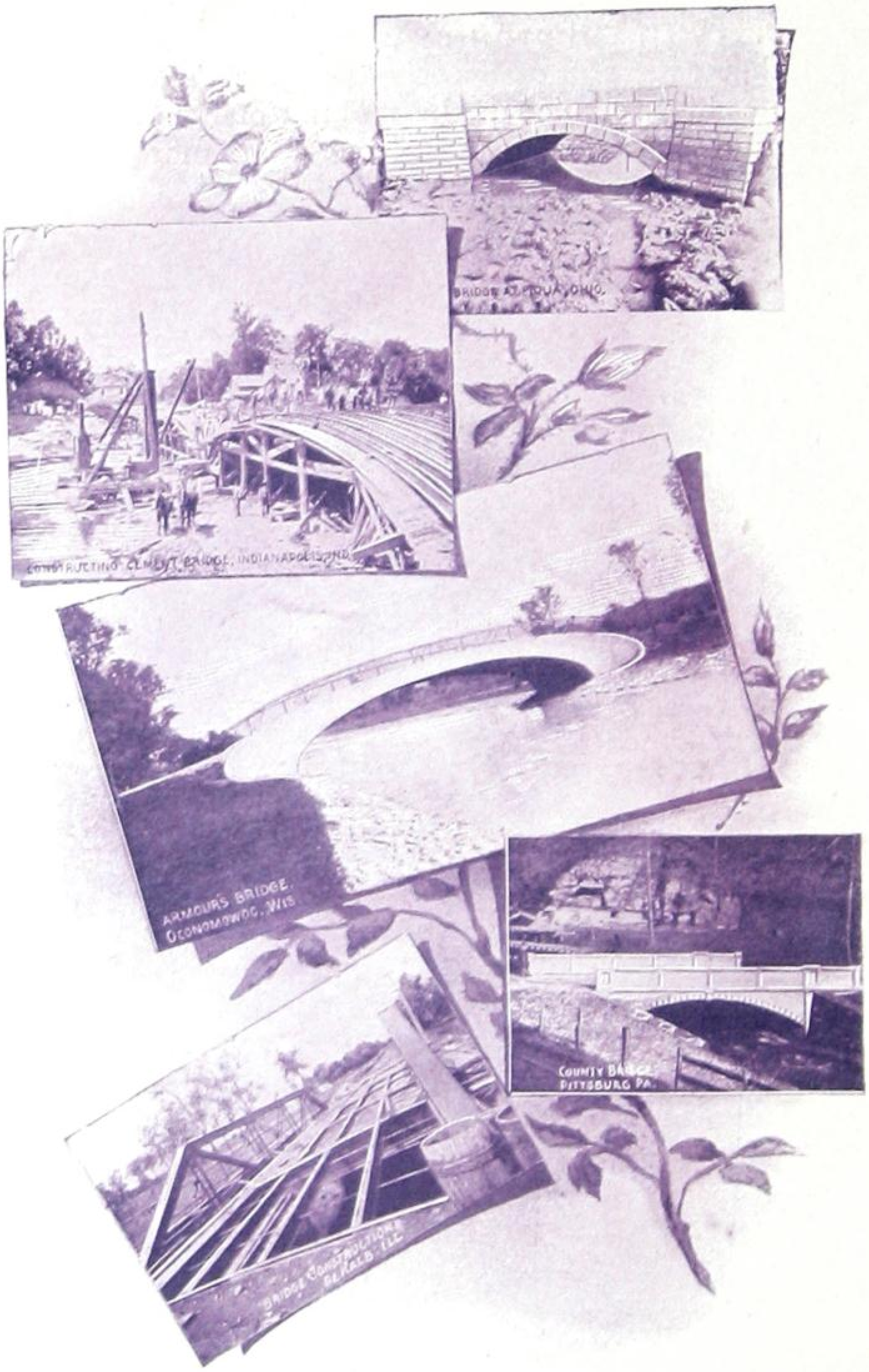

Street Paved with Portland Cement Bellefontaine, O.
Street Paved with Portland Cement Bellefontaine, O.

Bellefontaine, the American Pioneer in cement street paving. Several streets in this town, some of which the above cuts illustrate, are paved entirely with Portland Cement, have stood years of wear without the expenditure of a dollar for repairs, and are in excellent condition now.

The last yard of concrete in the walls of the Plaquemine lock was laid Nov. 17th. This lock is the largest piece of concreting in the world, containing 87,000 cubic yards, carried on a foundation of 9,000 piles driven into the ground forty feet.—*Scientific American.*

G. O. Totten, of Totten & Rogers, Architects, Washington, D.C., says:—"Portland Cement concrete is everlasting. Its cost, too, especially where architectural and ornamental forms are desired, is much less than that of stone."

Cement pipe laid during the Roman invasion in Great Britain is still in a good state of preservation, and the same is true of work done by the Romans in other parts of Europe.

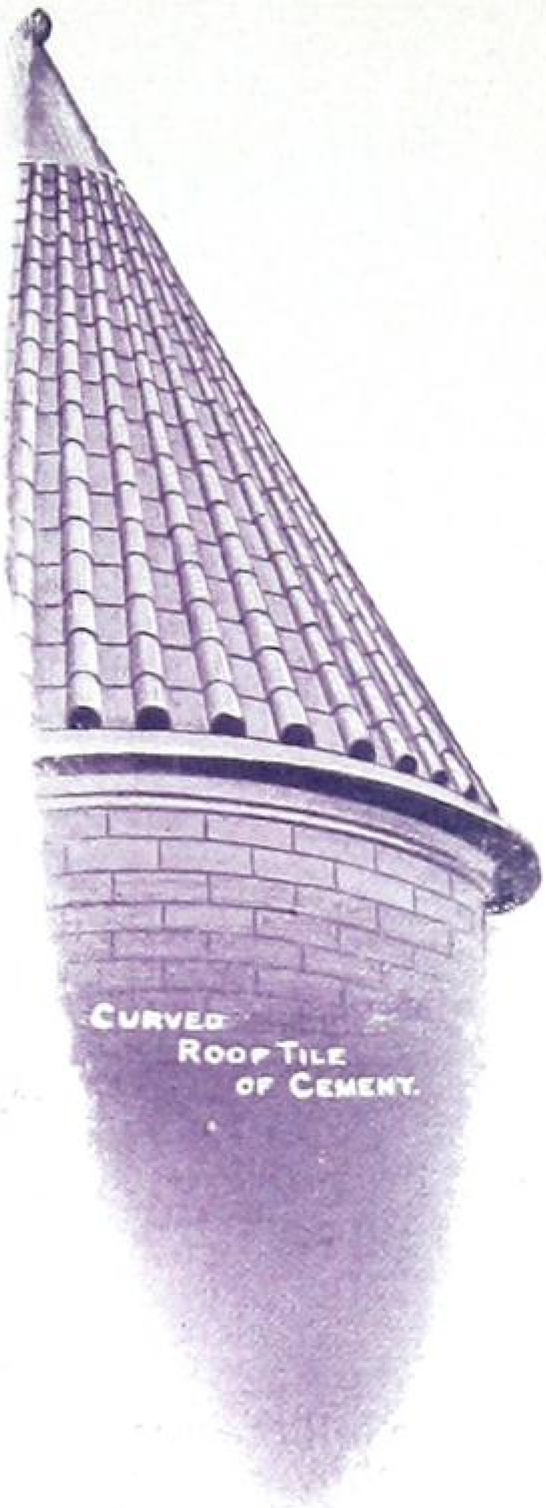

BRIDGE AT PIQUA, OHIO.
CONSTRUCTING CEMENT BRIDGE, INDIANAPOLIS, IND.
ARMOUR'S BRIDGE, OCONOMOWOC, WIS.
COUNTY BRIDGE, PITTSBURG PA.
BRIDGE CONSTRUCTION, DEKALB, ILL.

Cement Bridge Construction.

The Piqua Bridge is a cheap, plain but durable style for small bridges in rural districts. The Indianapolis Bridge illustrates the method of imbedding iron beams in cement concrete for the Melan Arch. The Armour Bridge shows the graceful low flat span possible in the Melan Arch system of bridge construction. The De Kalb Bridge has a floor of cement concrete slabs, held in place by steel I-beams. The railing, as well as the arch and floor of the Pittsburg Bridge, is made out of Portland Cement, expanded metal being used in its construction.

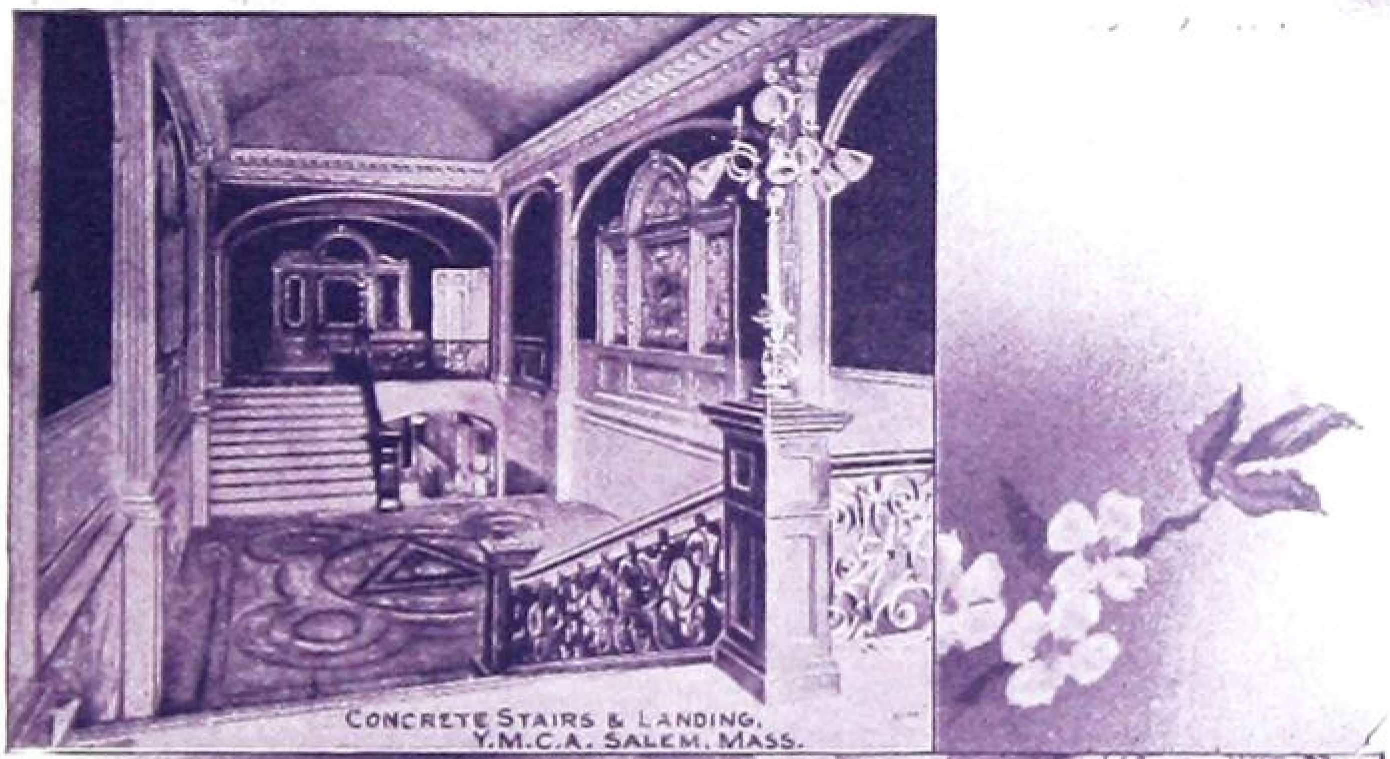
Depot of Cement

The Central Railroad of New Jersey has announced its intention of erecting a large and commodious new depot at Northampton, Pa., entirely of cement as an advertisement of the leading industry there. The cement bridge has just been completed at that place, and is a fine piece of work, attracting much attention.—*Cement and Engineering News*.

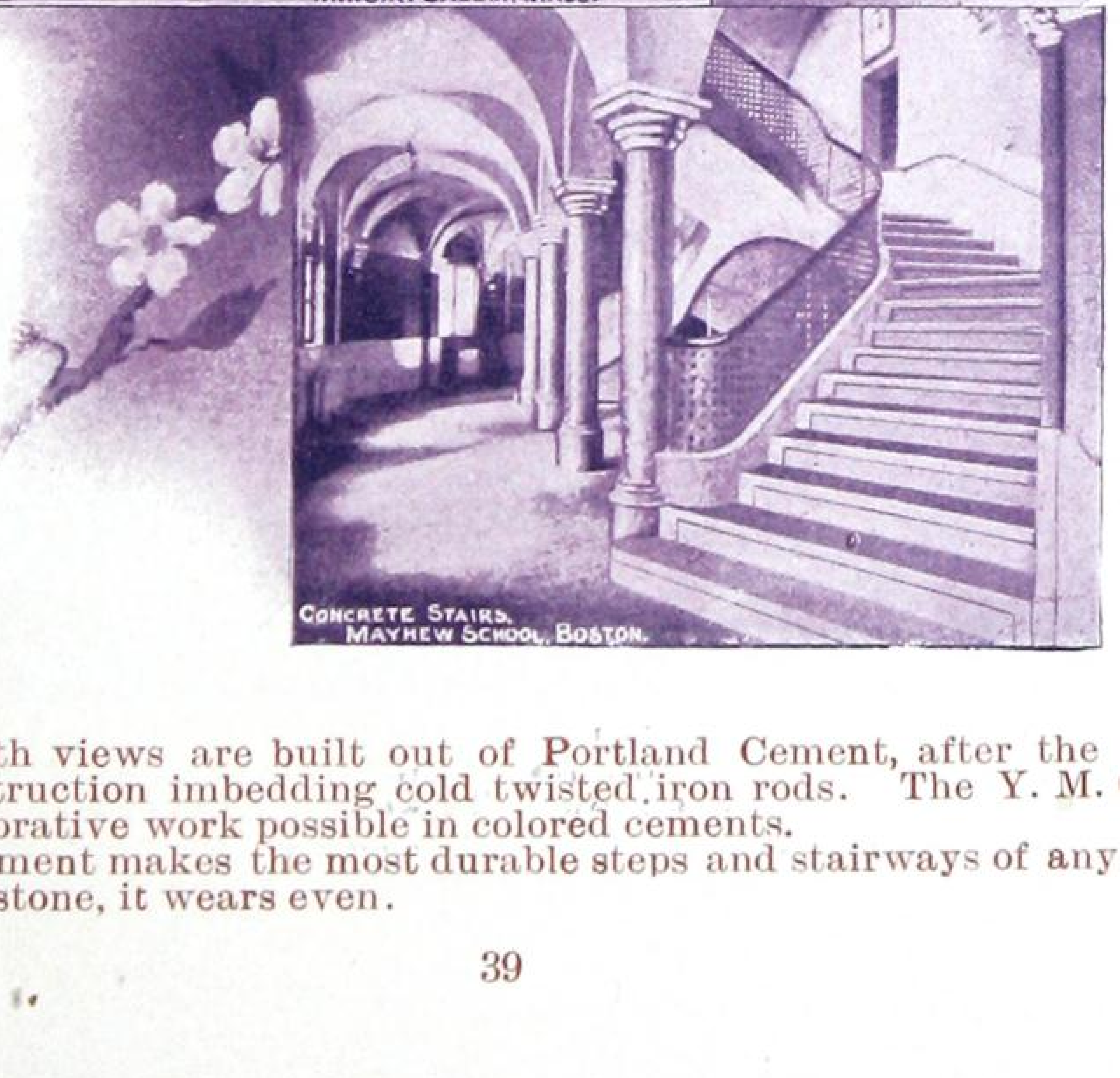


Curved Roof Tile of Cement.

Cement Tile are made of all shapes and colors. They are light, fire-proof and will not break under any condition. Even when heated to a white heat they will not break when coming in contact with water; are also frost-proof. The Tile shown herewith are made of Portland Cement by the American Cement Tile Company, Detroit.



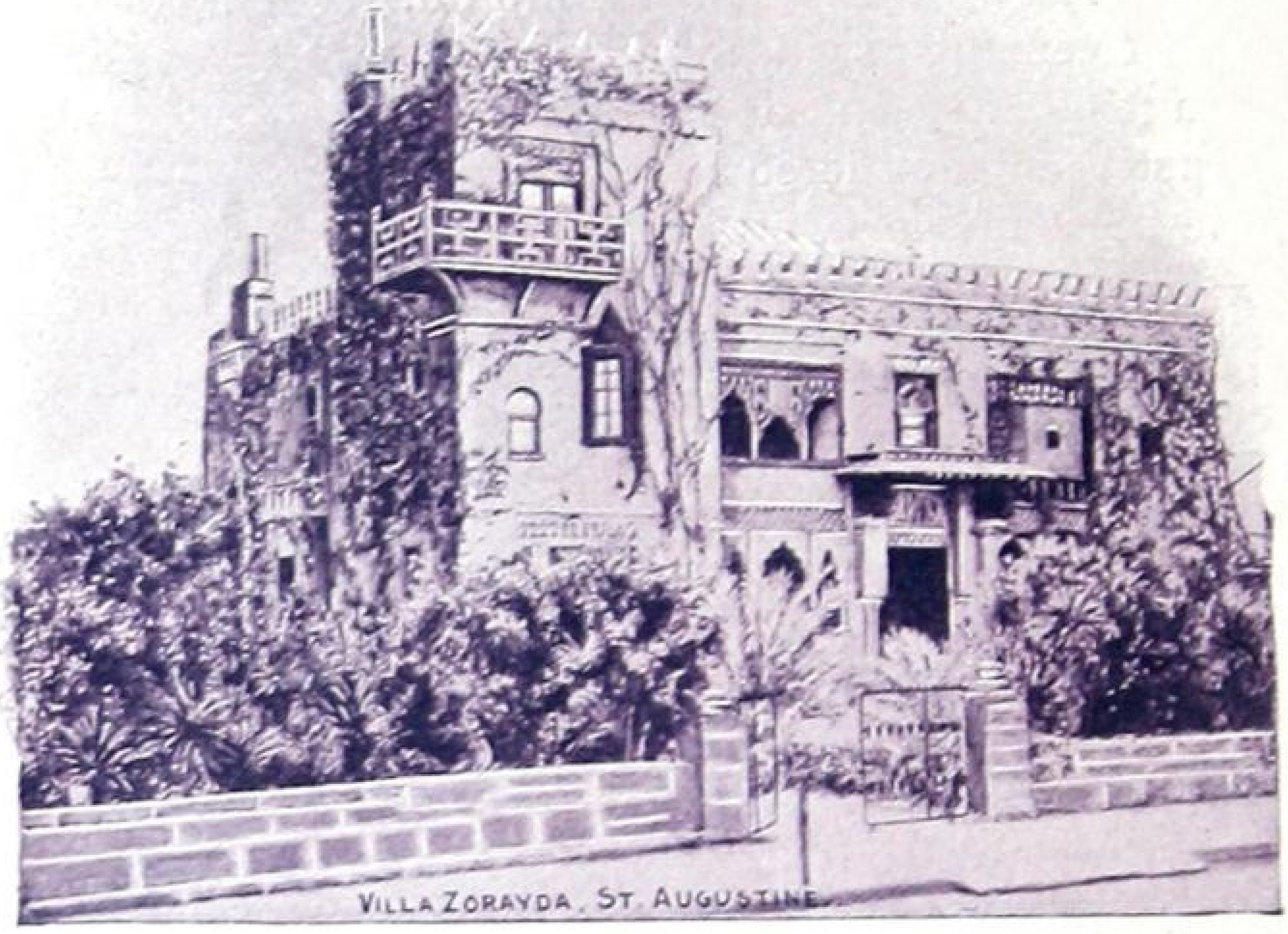
Concrete Stairs & Landing, Y.M.C.A. Salem, Mass.



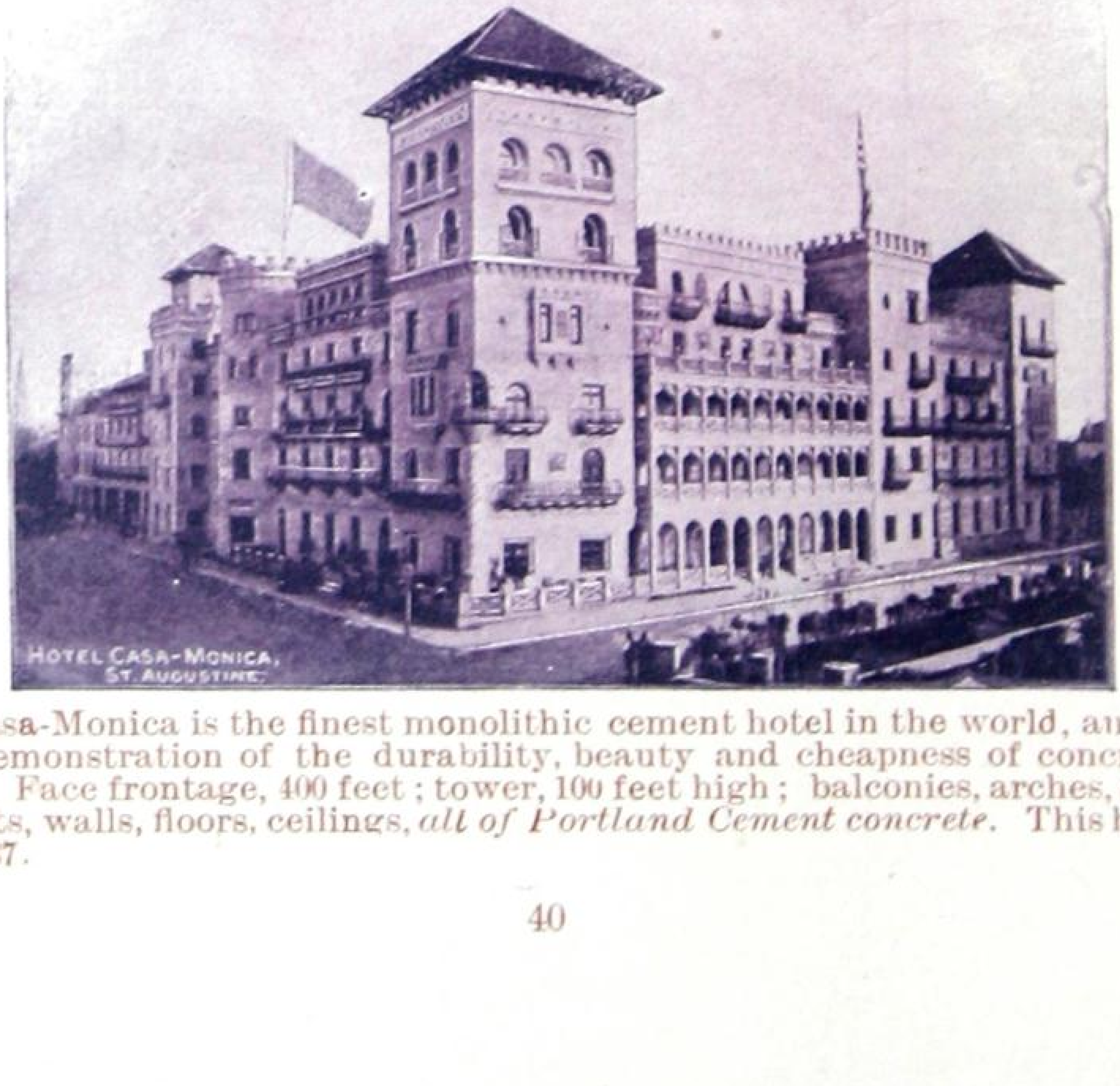
Concrete Stairs, Mayhew School, Boston.

Stairs in both views are built out of Portland Cement, after the Ransome system of construction imbedding cold twisted iron rods. The Y. M. C. A. hall floor shows decorative work possible in colored cements.

Portland Cement makes the most durable steps and stairways of any material known; unlike stone, it wears even.



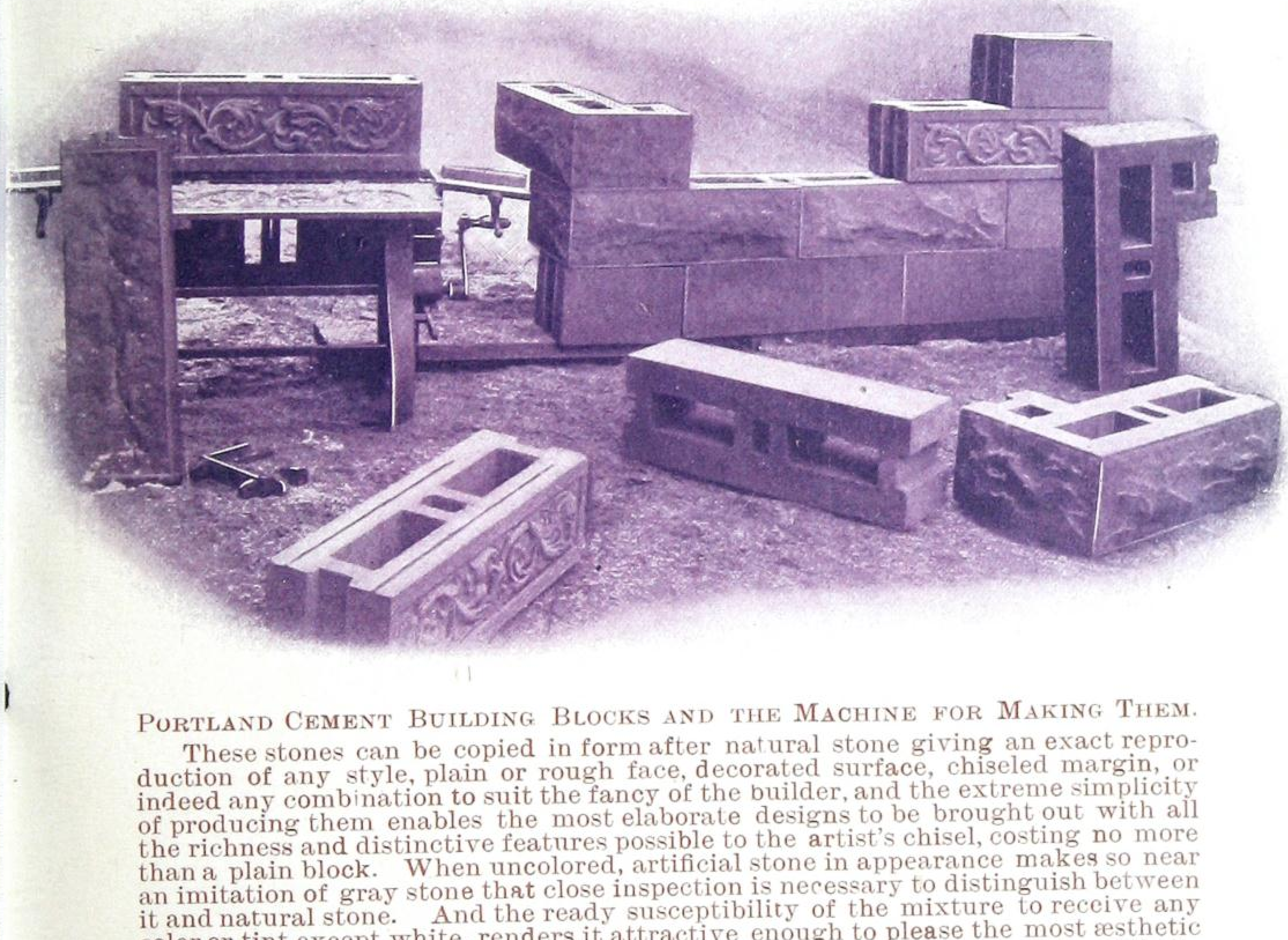
The Villa Zorayda, Mr. Franklin W. Smith's winter home, in St. Augustine, a cement concrete monolith of elaborate construction, modelled after the Palace of the Alhambra, and erected in 1883.



The Casa-Monica is the finest monolithic cement hotel in the world, and a substantial demonstration of the durability, beauty and cheapness of concrete construction. Face frontage, 400 feet; tower, 100 feet high; balconies, arches, cornices, battlements, walls, floors, ceilings, *all of Portland Cement concrete.* This hotel was built in 1887.

Portland Cement seems to be invading and displacing many of the old reliable materials used in building construction. It has now made another conquest in transforming old frame structures from wooden exterior to a Portland Cement finish. A building so transformed will be warmer in winter and cooler in summer. The rate of insurance will be cut down since the fire hazard will be less. There are a number of dwellings in Chicago that have been transformed in the manner above indicated, with the result that the transformation cannot be distinguished from a dwelling that has been constructed anew. When the cost is compared with the uniform good results obtained we cannot see why there should not be a great future for this class of work.

—*Cement and Engineering News*, Chicago.



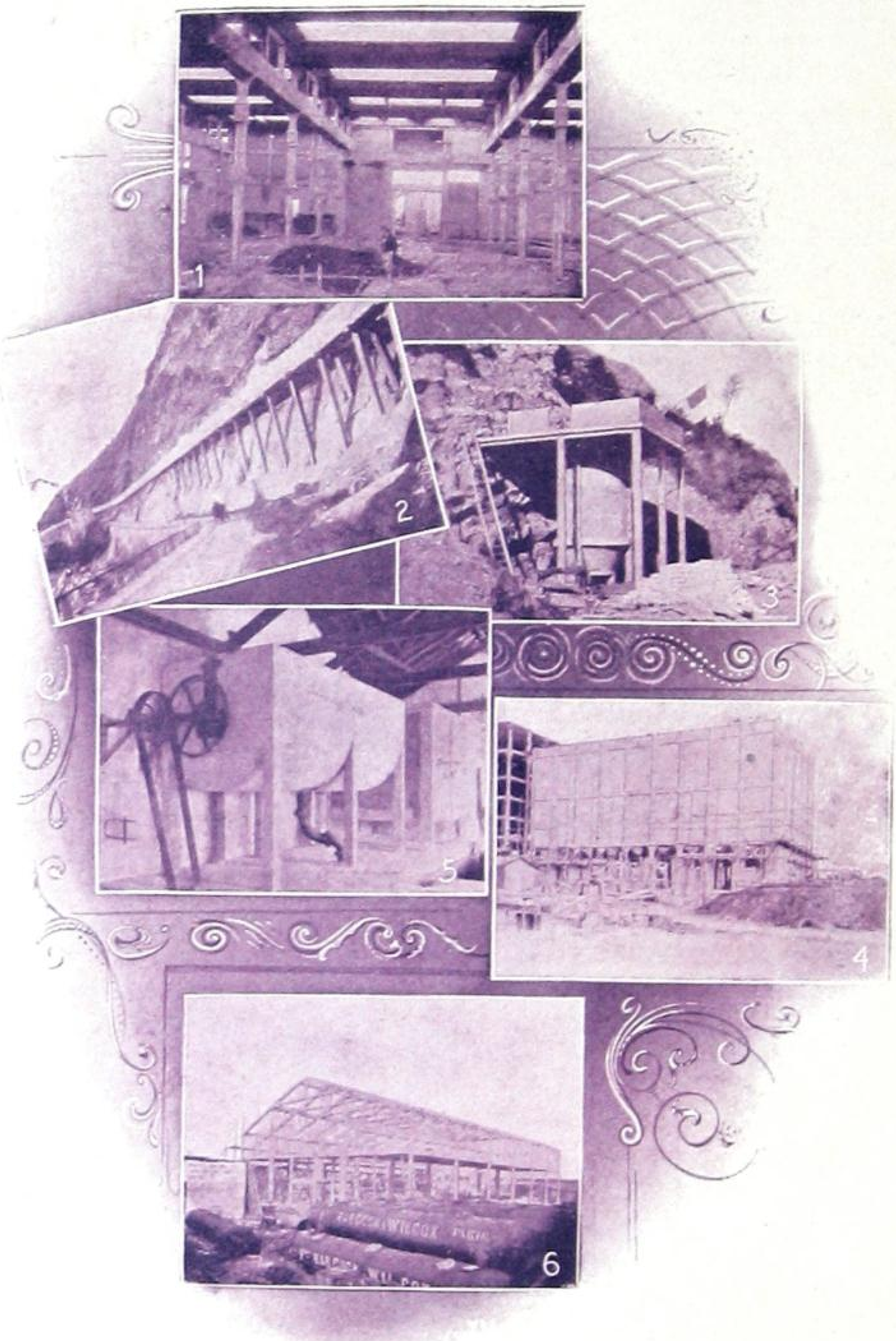
PORTLAND CEMENT BUILDING BLOCKS AND THE MACHINE FOR MAKING THEM.

These stones can be copied in form after natural stone giving an exact reproduction of any style, plain or rough face, decorated surface, chiseled margin, or indeed any combination to suit the fancy of the builder, and the extreme simplicity of producing them enables the most elaborate designs to be brought out with all the richness and distinctive features possible to the artist's chisel, costing no more than a plain block. When uncolored, artificial stone in appearance makes so near an imitation of gray stone that close inspection is necessary to distinguish between it and natural stone. And the ready susceptibility of the mixture to receive any color or tint except white, renders it attractive enough to please the most æsthetic taste, imitating all the varied hues of the most expensive stone or marble, while its lasting qualities are equal to those of granite itself.

The blocks, as the accompanying cuts show, are made with one-third the interior open space and jointed so as to form continuous vertical flues from bottom to top of wall, thus providing dead air chambers and reducing to a minimum the conductivity for heat, cold and moisture. These flues can be made the carriers of warm air or provide for a ready system of ventilation.

Furthermore, the hollow interior insures greater strength, in proportion to the material used, than could be obtained from a solid form. With such walls the expense for lathing can be entirely eliminated, since a cement or plaster coat can be applied direct to them.

When it is understood that concrete walls are absolutely fire-proof, vermin proof and need neither paint nor repair, and built of these blocks cost less money than if built of brick, the modern builder needs only to have his attention called to these facts to find in them an absorbing interest sure to ripen into enthusiasm as he pushes his investigations.



No. 1 shows construction of the Singrun machine shop at Golbey, entirely framed in concrete, including beams to support a movable crane of 30 tons weight.

No 2 gives a view of the Simplon canal, built along the abrupt mountain side to conduct the water of the Rhone for motive power to Brigues, Switzerland, a distance of two miles. The canal itself and the entire trestle work supporting it are built out of concrete.

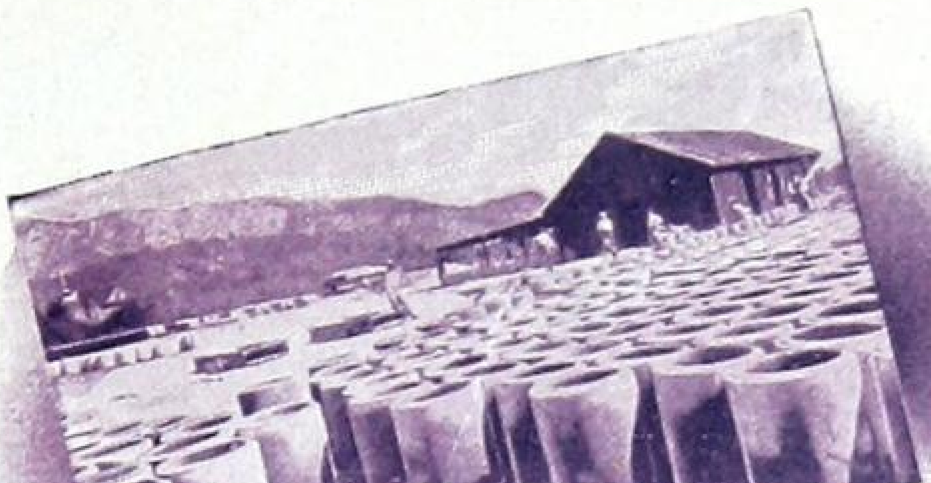
No. 3 shows a lime kiln at Luzech, built out of cement in which a constant temperature of 1,200 degrees heat is maintained.

No. 4 is the picture of a cement grain elevator at Strasburg, containing 45 bins each 50 feet high.

No. 5 gives interior view of a paper mill at Pelgues. Cement pulpvats, floors and partitions are noteworthy.

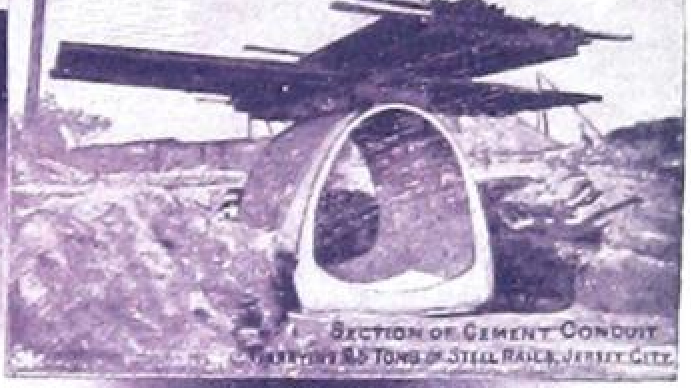
No. 6 illustrates a use for Portland Cement entirely new in America, but very popular in Europe. It shows the complete framing of a building in concrete, girders, plates, rafters, all framed in cement by the Hennebique system. The structure is erected for the Babcock & Wilcox Co., and employs cement girders of 49-foot reach.

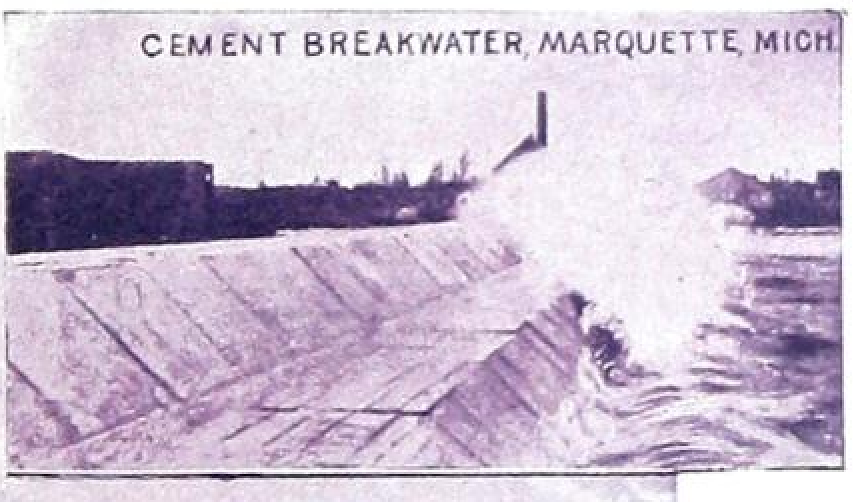
The crown of the reservoir is of solid cement concrete. The short lengths of cement sewer pipe shown are two or three feet in diameter and are made in crude moulds without expensive machinery and need no burning but only maturing by being kept wet for a few days. The last cut illustrates a very remarkable test made in June, 1900, by the New York Expanded Metal Co., on a portion of the conduit for the Jersey City water supply. Fifteen days after the section had been made, *25 tons of steel rails were piled on the section.* Three rails weighing approximately a ton were then twice dropped on one end of the loaded arch; all this produced only a deflection of 7-16 inch in height of arch, with a few cracks. On removing the rails a half month later *the arch resumed its original form with practically no damage.*


CEMENT SEWER PIPE, DUARTE, CAL.

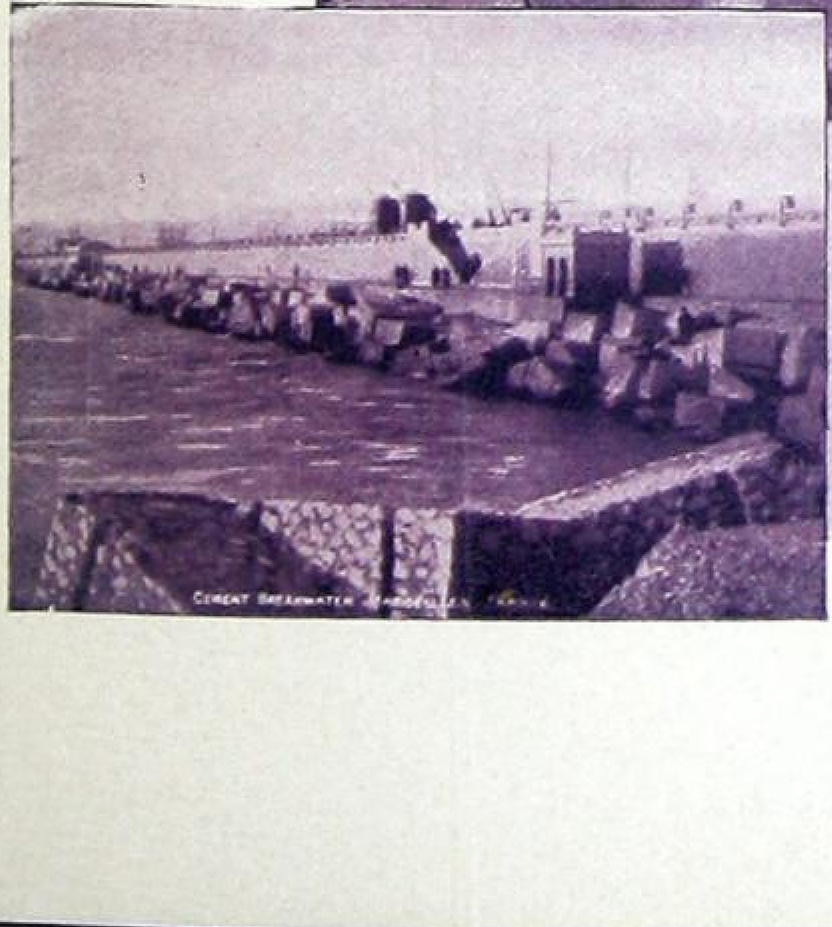
LAYING CEMENT SEWER PIPE

WACHUSETT'S RESERVOIR, MASS.


SECTION OF CEMENT CONDUIT CARRYING 25 TONS OF STEEL RAILS, JERSEY CITY.


CEMENT BREAKWATER, MARQUETTE, MICH.

CEMENT BREAKWATER, CLEVELAND, O.

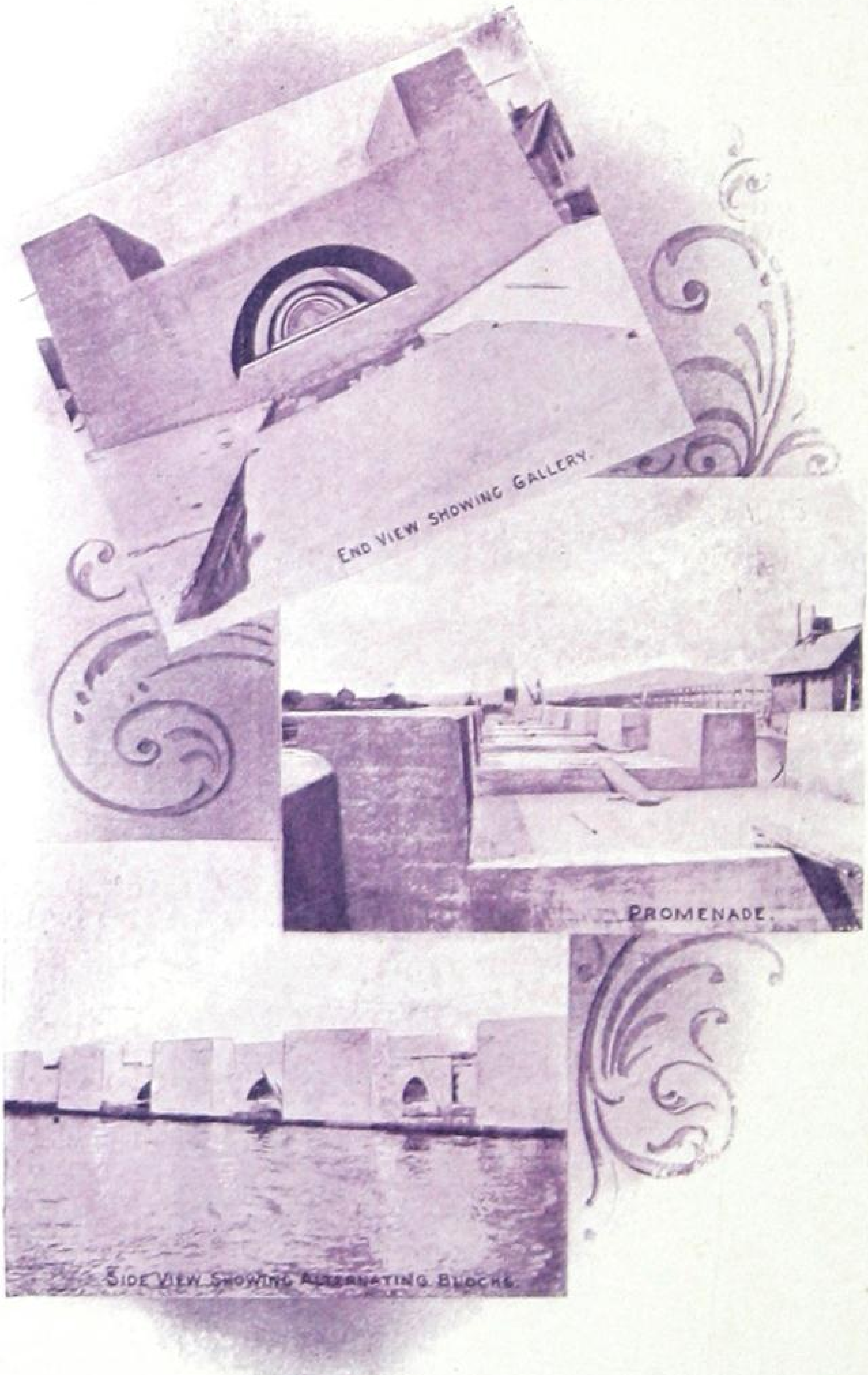

CEMENT BREAKWATER, MARSEILLES, FRANCE.

Over 80,000 barrels of Portland Cement were used in constructing the Cleveland Breakwater. The cut shows an angle of the Breakwater, top surface and parapet. The Marseilles jetty extends into the Mediterranean over two and a quarter miles and is built up from large cement blocks dumped somewhat promiscuously into the sea.

The Arroyo Ditch & Water Co., of Downey, Col., has just finished a 6 mile cement flume.

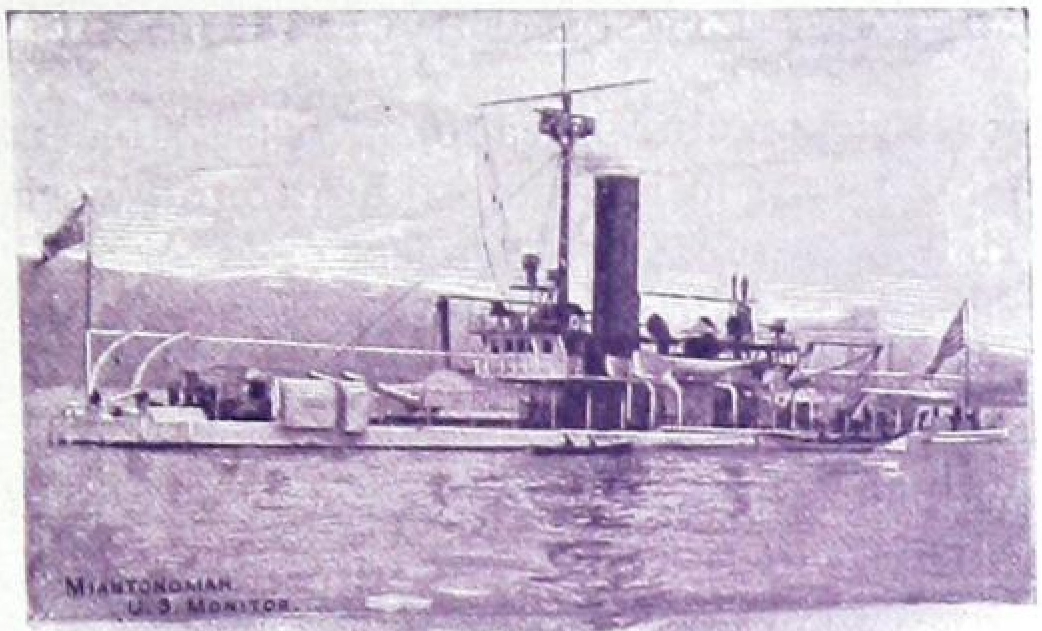
Large Constructions

15,000 barrels of Portland Cement will be used in the construction of the Indian River Pulp Mill. 30,000 barrels have already been contracted for by the Dominion Government for the preliminary work on the Trent Canal. 25,000 barrels of imported Portland Cement are now being used by the Dominion Government in the construction of a new lock at the foot of Maginn Street, Montreal. 40,000 barrels are being used in the construction of the Quebec bridge, and immense quantities are to be consumed in the $5,000,000 harbor improvement at Montreal. The above mentioned are but a small portion of the large constructious now under way in the Dominion in which Portland Cement will play an important part.

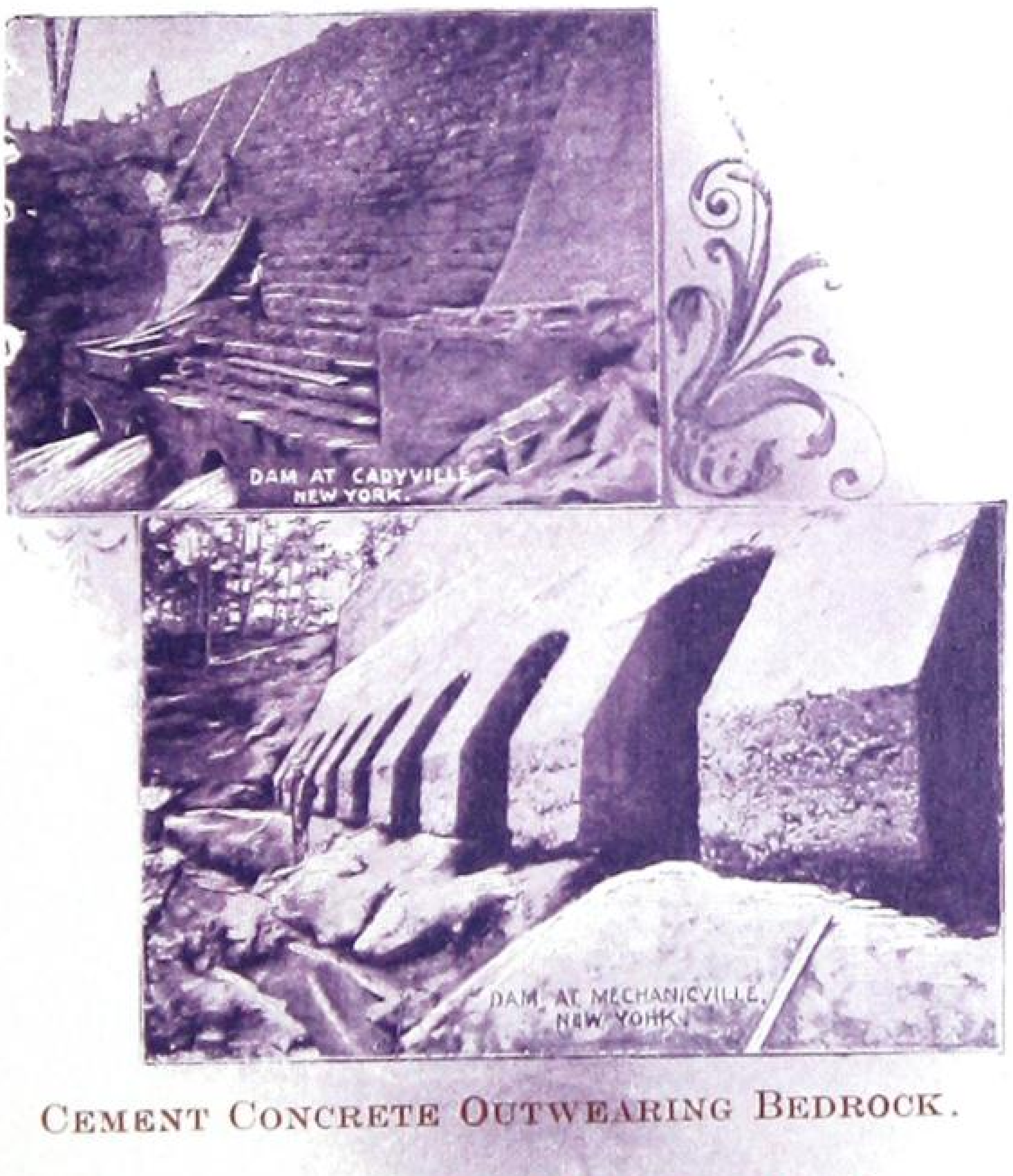

End View Showing Gallery.
Promenade.
Side View Showing Alternating Blocks.

Cement work on South Pier at the Duluth Ship Canal.

The south canal pier at Duluth, Minn., now under construction, is being done in blocks of concrete weighing 100 tons each, laid in alternate sections. The spaces between the alternate blocks are yet to be filled in.



The Miantonomah, one of the monitors belonging to the United States Navy, is lined with Portland Cement. This gives twice as great buoyancy as the steel which it replaces.

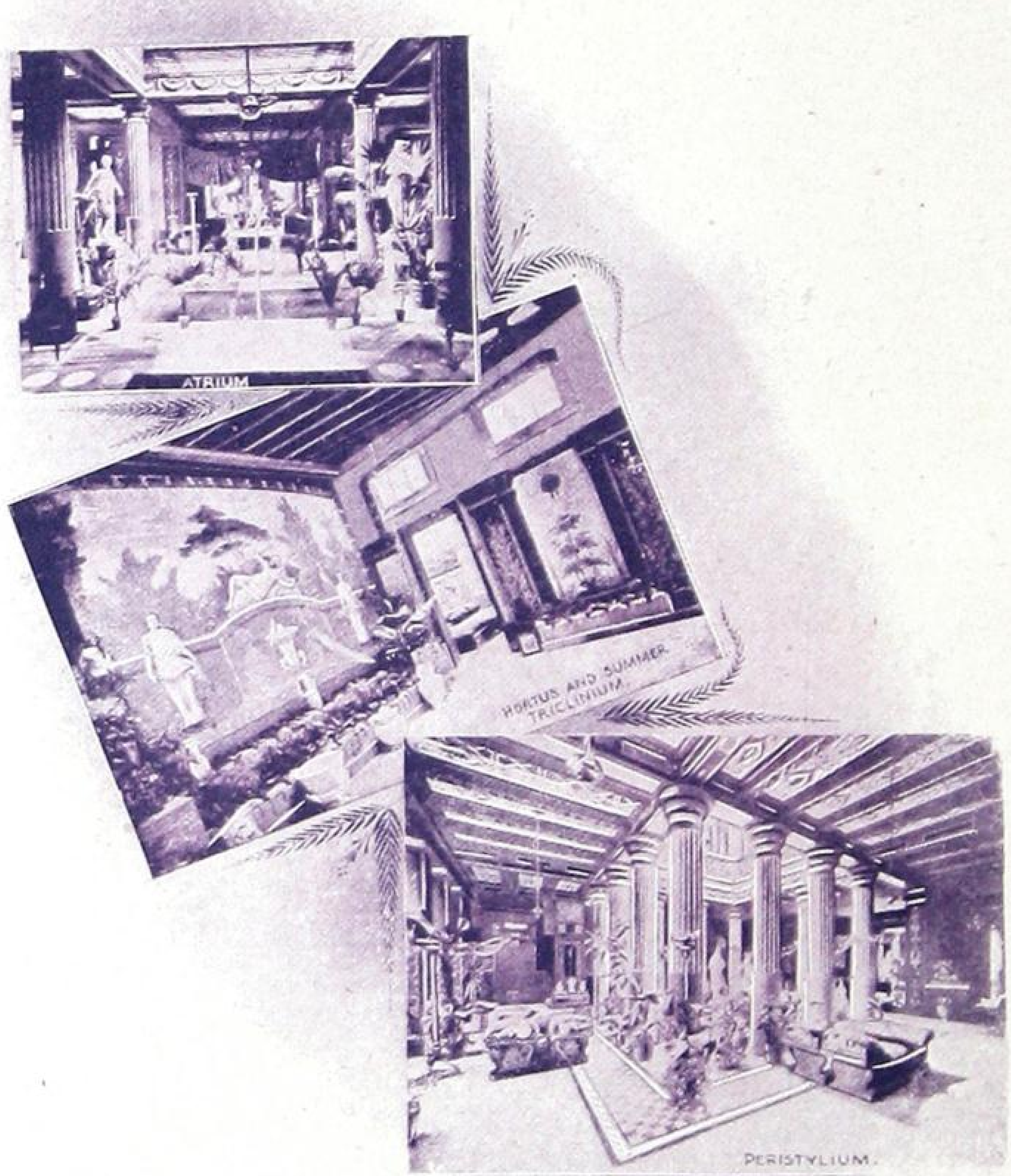


CEMENT CONCRETE OUTWEARING BEDROCK.

The above illustrated portion of the Mechanicville Dam was built for the Hudson River Power Transmission Company, entirely of cement concrete and is 16 feet high, extending from an island in the Hudson River to the east bank, a distance of 800 feet. The waste gates shown in the cut were some of them only ten days old when the Hudson River was diverted from its course and run through them. On being examined the next year, it was found that the exposed concrete was practically perfect while the bed rock of the river had been excavated by the scouring action of the current, leaving holes to the depth of 10 feet in places on the downstream side, above which the cement piers overhung SQUARE-CORNERED and practically UNHARMED.

City Engineer Ericson Favors Cement Concrete

City Engineer Ericson, of Chicago, says:—"Recent tests of cement concrete for general construction and underground work have proved it to be superior to brick and stone, both in cost of labor and in its durability. It costs Chicago $8.00 a day for tunnel bricklayers, while concrete tampers can be obtained for $2.00 a day. I believe from 30 to 40 per cent. in cost can be saved by the use of cement concrete. It is, therefore, very probable that the future will see a much more extensive use of this material than in the past."—*Cement and Engineering News*, Chicago.



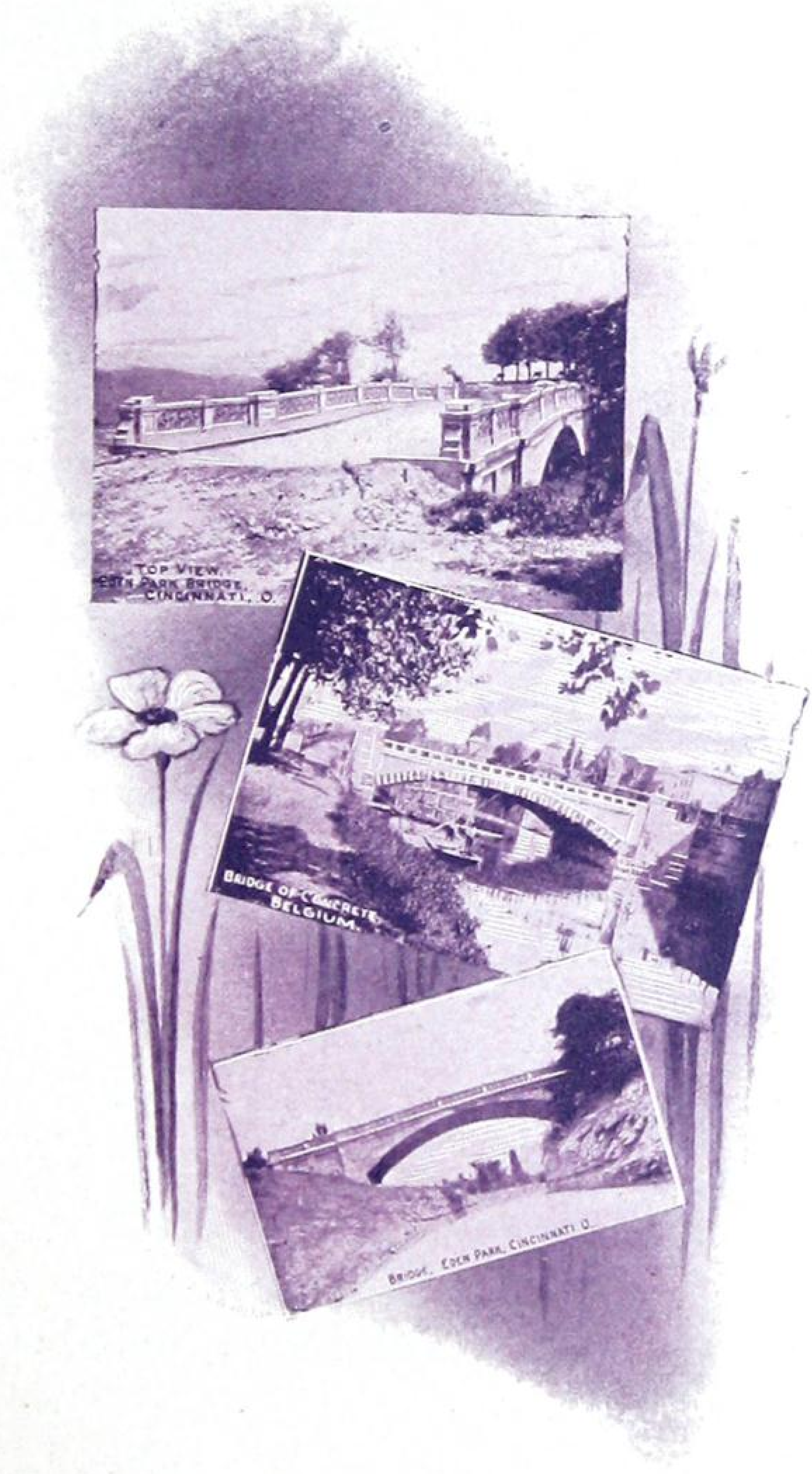
Interior views in the Pompeia, at Saratoga, N.Y., floors, walls, pillars, caps, architraves, etc., all of Portland Cement.

Cement Bridge at Kankakee

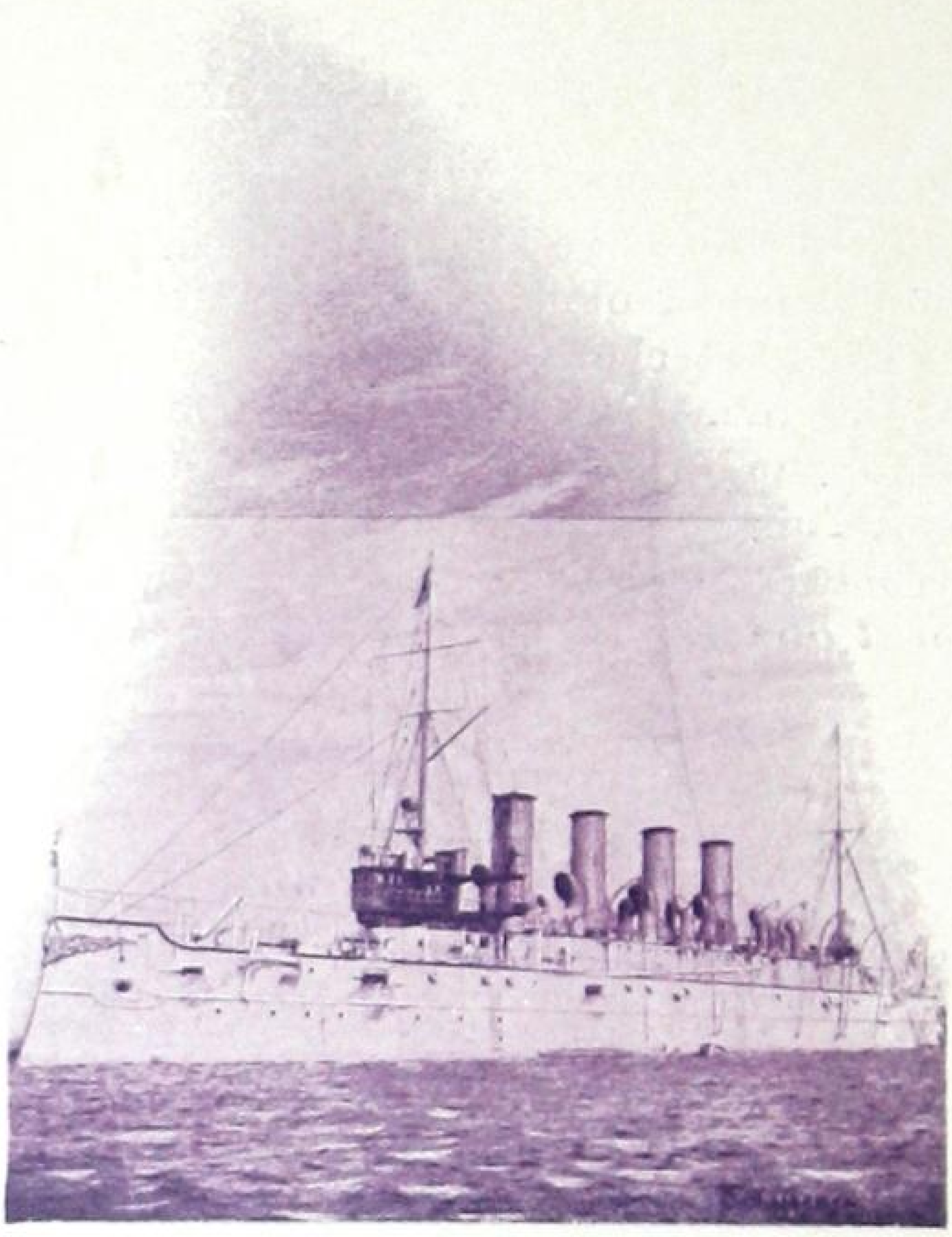
The City Council of Kankakee, Ill., has adopted plans for a cement bridge across the Kankakee River. The bridge will be 600 feet long and 36 feet wide, including an 8-foot sideway on one side. It is to be a solid concrete bridge, without steel or iron.

The American Cement Co., of Philadelphia, will furnish 1,500,000 barrels of cement for the New York Rapid Transit subway construction.

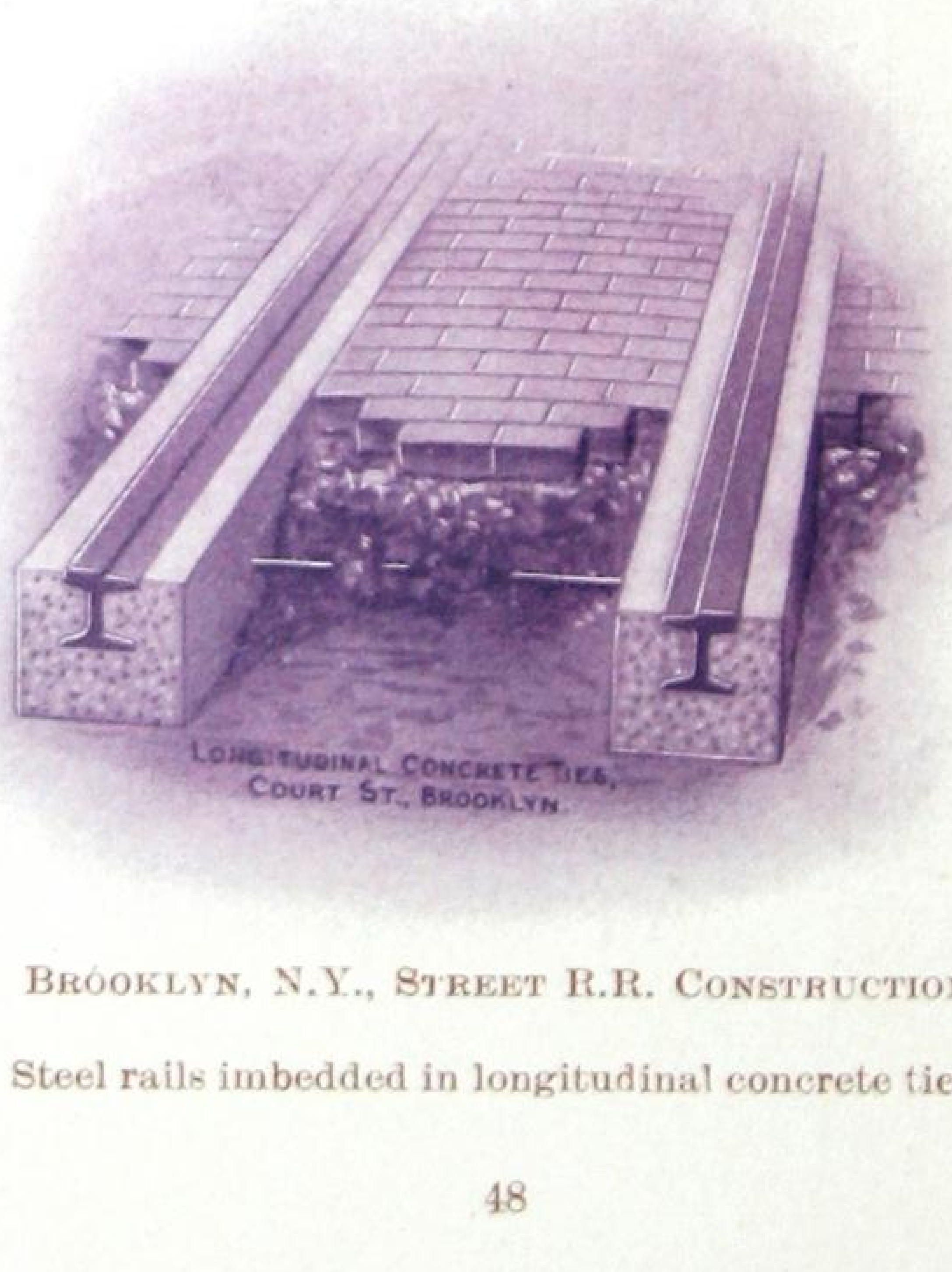
Houston Bros., Thirty-second street and Penn. R.R., Pittsburg. Pa., will furnish 30,000 barrels of cement for the new Laughlin furnaces at Pittsburg.—*Cement and Engineering News*, Chicago.


TOP VIEW EDEN PARK BRIDGE CINCINNATI, O.
BRIDGE OF CONCRETE BELGIUM.
BRIDGE, EDEN PARK, CINCINNATI, O.

Abutments, arches, floors, railings, all of Portland Cement.



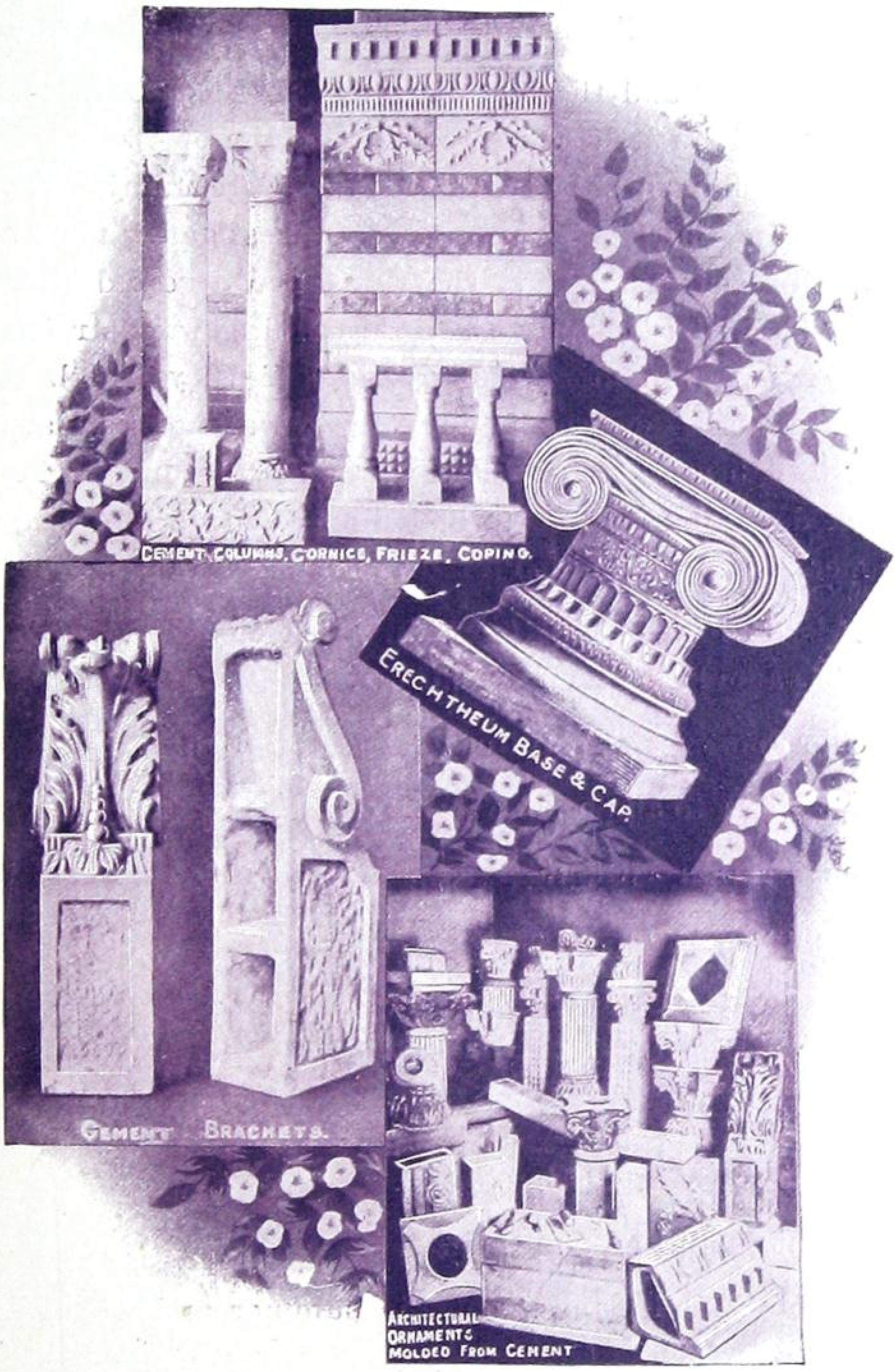
The Columbia, one of the cruisers belonging to the United States Navy, is lined with Portland Cement. This material, at the age of one year, will stand a crushing strain of 220 tons to the square foot.



Brooklyn, N.Y., Street R.R. Construction.

Steel rails imbedded in longitudinal concrete ties.

Messrs. John Aud & Co., of England, are building a dam or barrage for the Egyptian Government at the first cataract of the river Nile, near Assuan, Egypt, which will consume 3,000,000 barrels of cement and will cost $12,000,000. One thousand European workmen and 2,500 natives are employed on the work under General Manager John Blue. The dam will be 76 feet high and the top of the dam will be from 30 to 40 feet wide, and will be used as a bridge. It will impound the flood-waters of the Nile 76 feet above low water for irrigating purposes, from which the Egyptian Government will derive a revenue of $2,000,000 annually.—From *Cement.*


CEMENT COLUMNS, CORNICE, FRIEZE, COPING.
ERECHTHEUM BASE & CAP.
CEMENT BRACKETS.
ARCHITECTURAL ORNAMENTS MOLDED FROM CEMENT

The illustrations on this page give an idea of the possible variety in artificial building stones and show clearly the adaptability of Portland Cement to every conceivable problem involved in architecture. Economy, durability, and texture of natural stone, are marked characteristics of good artificial stone.

Advantages of Concrete Structures

1. Durability.—It will last not only centuries, but thousands of years.

2. It is fireproof and therefore saves insurance. Of a large factory recently destroyed by fire a concrete wall was the only one left standing. In the great Pittsburg fire the concrete floors were uninjured and intact. After the fire in Chicago a commission investigated the comparative fireproof qualities of material in the ruins, and reported their order as: (1) concrete; (2) brick; (3) stone. The Boston fire swept streets of granite blocks into ruins even more quickly than if they had been of wood. Sheets of flame spread over ranges of granite warehouses, slates flew into fragments, iron beams and girders warped and bent, while the stone blocks cracked, tumbling the so-called fireproof piles into heaps of ruins, but the concrete walls remained intact.

3. It resists vibrations better than brick or stone, and has largely displaced the same in engine foundations.

4. Anchor rods are not required.

5. Adaptability to all possible forms or shapes.

6. Transportation without the use of derricks at both terminals.

7. It sets under water.

8. Requires no expense of maintenance.

9. It is far cheaper than stone, and 10 cents cheaper per cubic foot than common brick.

10. Rapidity of construction.

11. Absolutely air and water-tight.

12. Concrete buildings are cooler in summer and warmer in winter than any other.

The day of ignorance regarding the true value of cement and its proper manipulation and application has passed; and the dawn of a new era, the Cement Age, has dispelled all doubts and fears; and to those connected with building arts has come the full realization that the stone of nature has at last met a successful rival.

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